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DETERMINANTS OF FDI INTO DEVELOPING COUNTRIES

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I. Introduction¹

Evidence of foreign direct investment (FDI)², which often refers to investment made by multinational enterprises (MNEs) in foreign countries, can be traced back to before the 1950s under the form of the transfer of capital between developed countries. This channel of capital transferring did not attract much attention from scholars until its huge surge in the 1980s due to a shift in FDI flows from developed countries to developing countries. Average FDI inflows to developing countries nearly doubled between 1980 – 1985 and 1985 – 1990. Furthermore, starting in 1990, the share of FDI flows to developing countries increased while it decreased to developed countries. Between 1994 and 2014, the share of FDI inflows to developing countries increased from 37% to 57.7%, surpassing the share to developed countries. This shift in the distribution of FDI raises the question of what is driving such a change.

The period 1980 – 1995 when FDI inflows started increasing to developing countries is also associated with the liberalization of many developing countries. Prior to 1980, Latin American countries suffered from a debt crisis and the failure of their import substitution policies. Thus, many Latin American countries opened up their economies in 1980 in order to help their economies recover, by lowering trade barriers and privatizing state owned companies. Consequently, FDI inflows into Latin America surged during 1980 – 1984, contributing to the 3% growth of FDI inflows into developing countries. In 1985, China began steadily opening up its economy due to its lack of capital after the failure of the Cultural Revolution. As a result, FDI inflows into developing countries during the period 1985 – 1990 grew at the considerable rate of 22%. India also opened up its economy after its currency crisis in 1991 and implemented a series of reforms. Both the liberalization of China and India led to a 54% growth rate of FDI to Asia in 1993.

FDI flows from country to country when there exist incentives on the part of both investors and recipient countries. The motives for MNEs investing abroad include entering new markets, taking advantage of natural resources, or internalizing the production process of intermediate goods. On the other hand, recipient countries welcome FDI as it can bring about economic growth, technological spillovers, and generate employment. For developing countries, investment from abroad plays a vital role especially at the early stage of economic development. As explained by Rosenstein-Rodan's big

¹ All statistics in this section were obtained from the UNCTAD World Investment Reports.

² Formal definition of FDI by the World Bank: "Foreign direct investment are the net inflows of investment to acquire a lasting management interest (10 percent or more of voting stock) in an enterprise operating in an economy other than that of the investor."

push model³, least developed countries are often trapped in poverty because they lack the large amount of capital necessary to initiate sufficient investment to address coordination failure and accelerate their economic development. As a result, they tend to seek out official development assistance or attract FDI to fuel the development of capital-intensive industries.

In the early stages of economic development, developing countries tend to attract mainly investment in primary resources due to their relative abundance in labor force and natural resources, and their lack of infrastructure and human capital. However, as a country develops, it has more advantages to offer, such as better financial and political regulations, and production tends to shift away from primary products and traditional manufacturing to more progressive industries. In 1970, natural resources accounted for approximately 23% of the world FDI stock, as compared to 31% in services. By 1990, only 11% of the world FDI stock was in natural resources, while 50% of it was in services. From 1990 – 2002, 7% of the FDI stock in developing countries was invested in natural resources, while FDI in services increased from 47% to 55% of the total stock of FDI into those countries during the same period. This shift in FDI suggests that the flows to developing countries from 1990 to present have shifted towards service and knowledge – capital intensive industries. In particular, in several Latin American countries, industries requiring large-scale financing such as electricity, telecoms, and water attracted a large amount of FDI flows in the years when the government privatized those industries. Furthermore, in the mid-1990s, FDI accounted for approximately 10% of investment funds for the electricity industry in China. In India, 60% of FDI went towards infrastructural and manufacturing projects during the period 1991 – 1995, but from 2003 to 2004 investment shifted towards information and communication technology industries.

Despite the global trend of a sectoral shift in FDI, African countries, unfortunately, have lagged behind in this trend. It was not until 2012 that FDI inflows showed a sectoral shift in Africa. Since 1980 FDI inflows have been predominantly invested in the primary sector, while services and especially manufacturing industries have only attracted more investment recently. Furthermore, Africa's share of FDI inflows, on average, accounted for 2.4% of world FDI inflows during 1980 – 1984 and increased only to 4.4% in 2015. It is possible that many countries in this region are considered too risky for investment due to the existing political instability.

Overall, the incentives for FDI vary vastly across time periods and regions. A preliminary analysis suggests that since 1990, investors tend to look for countries which can provide them with advantages in services and knowledge – capital intensive manufacturing industries. These advantages include the human capital stock and market size of the host country. On the other hand, considering a longer period, from 1980 to 2014, the more predominant advantages are natural resources and labor force. In this paper, we study two questions regarding what drives FDI to developing countries. First, what are the determinants that make specific developing countries more attractive as a destination of FDI? Secondly, have these determinants differed between the time period 1980 – 2014 and 1990 – 2014? We follow the seminal work by Dunning as the theoretical basis for our empirical model and consider as many developing countries as possible given data limitations.

The rest of the paper is arranged as follows. The next section introduces the theoretical background of FDI studies in general. Then, we introduce and review the empirical literature. The

³ Murphy, Shleifer, & Vishny (1989)

fourth section specifies the empirical model, followed by the data and methodology sections. Lastly, the seventh section discusses our results, while the eighth concludes.

II. Theoretical Background

Literature on foreign direct investment and the incentives for investors to operate abroad flourished in the 1970s. The two theories which were most prominently discussed are based on neoclassical trade theory and internalization theory. The former, introduced in the 1960s, was built upon the main argument of the Heckscher-Ohlin (HO) trade model to explain the motives behind investors who operate production chains abroad, but export products back to their home country. The theory argues that, because of heterogeneity in countries' endowments, there exist incentives for foreign firms to transfer their abundant production factor to where the returns on the factor are higher. Thus, with these incentives, foreign firms will keep locating factories in different countries until factor prices are equalized.

The other main stream theory, internalization theory, which was introduced by Buckley and Casson in 1976, also examines the motivation behind FDI. Instead of outsourcing different parts of the production process, this theory points to the fact that internalizing these processes is likely the least expensive way for MNEs to benefit from a foreign market due to lower transaction costs. A prominent example is when a foreign firm owns an innovative technology, the best way to profit from it in a new market is to internalize the production chain in that market. This way, firms can reduce the risk that their technology is stolen and expect higher profits because of lower transaction costs.

In 1992, these two theories were combined by Dunning to form his OLI paradigm, a seminal framework that has been widely used as the foundation for empirically examining the determinants of FDI. According to Dunning (1988), the OLI paradigm consists of 3 sub paradigms from which one can analyze the reasons why firms engage in FDI (or increase existing FDI): ownership (O), location (L), and internalization (I). The first sub paradigm (ownership), which is closely related to the argument derived from the HO model, explains that specific competitive advantages of foreign firms are one of the motives behind foreign investment. These advantages range from technological advantages to specific expertise and managerial skills, which enable foreign firms to operate profitably in the host country despite not being a local company. The second sub paradigm (location) explains that investment abroad provides MNEs with some immobile advantages specific to the host countries, such as cheap domestic labor, natural resources, and favorable regulations. The third sub paradigm (internalization), largely influenced by Buckley and Casson's internalization theory, points to the benefit of foreign investment from acquiring companies abroad to internalize the production process of intermediate goods. This sub paradigm argues that as long as the benefit of engaging in FDI to produce intermediate goods is higher than that of granting the right to local firms, MNEs are likelier to remain involved in these activities themselves.

Combining the different aspects of these paradigms, Dunning categorizes the incentives of investors into three types: market seeking, resource seeking, and efficiency seeking. Market seeking investment is based on the premise of seeking new consumer bases. This type of investor is interested in entering a new market or introducing a new product, especially where their market power and profit can be maximized. Thus, market seeking FDI is often directed towards import substituting countries. To overcome import barriers, these investors establish factories and produce their product inside the

host country's borders. Moreover, it is even more beneficial to market seeking investors when the host country also provides them with location advantages, such as a cheap labor force, to facilitate their production process. Market seeking investors are thus highly concerned with both the potential consumer base and likely production resources of their host countries. On the other hand, natural resources, labor force, and trade openness are considered critical by resource seeking investors. These investors prefer export oriented host countries, and mainly seek out countries with exportable resources and an open trade policy to either export their resources back to the investors' home country or to engage in the regional market. Some determinants considered attractive by resource seeking investors are trade openness, labor force, and natural resources. Last but not least, the potential type of investment geared towards emerging countries is efficiency seeking FDI. Under the circumstance that a market is already well established in the host country, efficiency seeking investors who possess highly efficient production processes can still make a profitable investment abroad by taking advantage of economies of specialization and scope across value chains. These investors look for higher quality human capital, stable governments, and high quality infrastructure as necessary pre-conditions for investment. As new markets become difficult to establish, investment from abroad gradually shifts towards the efficiency seeking type.

III. Empirical Literature Review

The advantage of using Dunning's theory as a framework for empirical studies of FDI lies in its flexibility, as it allows for a variety of factors to be considered as determinants of FDI depending on the investment decisions of MNEs. Based on this framework, FDI studies have narrowed down the potential determinants of FDI to include market size, macroeconomic stability, trade, financial development, infrastructure, natural resources, labor skill, and labor force. Of these determinants, market size, labor force and macroeconomic stability are important to market seeking investors; natural resources and trade openness affect resource seeking investors; and financial development, infrastructure, and labor skill are critical to efficiency seeking investors. These variables, though strongly supported by theoretical arguments, however, have not been consistently proven to be significant in all empirical work. After surveying key empirical studies, Chakrabarti (2001) concludes that the only empirically supported FDI determinant is market size, while empirical evidence for other determinants is not congruous. In this next section, we review the theoretical arguments, following Dunning's theory closely, as well as the empirical evidence, and the measurements commonly used for FDI determinants.

a. Market Size, Macroeconomic Stability, and Trade Openness

Market size, macroeconomic stability, and trade openness are three classic explanatory variables used in any study of FDI⁴, not only due to the weight of their theoretical arguments but also because of their significance in empirical studies. To maximize their return on investment, market seeking investors are highly concerned with the size of their possible consumer base, while resource seeking investors prefer countries with an open trade policy. Macroeconomic stability is considered a necessary precondition by all three types of investor, as less volatility in potential returns is more

⁴ Nunnenkamp & Spatz (2002); Yasmin, Hussain, & Chaudhary (2003); Janicki & Wunna (2004); ÇEviş & Çamurdan (2007); Kok & Acikgoz Ersoy (2009); Shahmoradi & Baghbanyan (2011); Basu, Chakraborty, & Reagle (2003); Kolstad & Villanger (2008); Škuflić & Botrić (2006); Al-Sadig (2009); Noorbakhsh, Paloni, & Youssef (2001); Williams (2015); Krifa-Schneider & Matei (2010); Bénassy-Quéré, Coupet, & Mayer (2007); Busse, & Hefeker (2007); Chakrabarti (2001)

likely. Of these three determinants, market size is widely accepted as a significant determinant of FDI, according to the survey conducted by Chakrabarti (2001), while trade openness and macroeconomic stability remain under dispute. However, as all these variables are considered important in the theoretical literature, they are all included in our model.

The proxies for market size which are widely accepted and have been found to be statistically significant and positive are GDP and GDP per capita (Chakrabarti, 2001). The difference between the two measures are their interpretation, where GDP represents market size in general, while GDP per capita indicates the consumer base of the country. Since the focus of our study is developing countries, where both GDP and population size vary greatly, we believe GDP per capita to be a more suitable proxy for market size for the purpose of this research.

As stated previously, both trade and macroeconomic stability have been included in many studies with mixed results. However, the majority of the empirical studies we reviewed found trade to be significant, despite considering different groups of countries and time spans⁵. Trade is found to be insignificant though in the study by Montero (2008). Macroeconomic stability, on the other hand, which is measured by inflation (GDP deflator), is significant in the studies by Al-Sadig (2009), Asiedu (2006), Çevis & Çamurdan (2007), Ranjan & Agrawal (2011), and Williams (2015), while it poses no significant impact on FDI in the studies by Adams (2010), Busse & Hefeker (2007), Kolstad & Villanger (2008), and Montero (2008). It is possible that these mixed results could be due to the differences in time spans and considered countries. In our study, we choose the classical measurements, trade volume as a percentage of GDP and inflation, as proxies for trade openness and macroeconomic stability.

b. Labor Factors (labor force and labor skill)

In the OLI framework, Dunning refers to a large and cheap labor force as a location advantage of developing countries because this advantage is immobile and specific to the host country. This factor incentivizes resource and market seeking investors to locate their production processes in the host country to lower production costs, to overcome import substituting trade barriers, or to take advantage of their trade openness. Indeed, many empirical papers⁶ have considered the significance of the labor force in driving FDI. The proxies for labor force that have been found to be significant are labor force participation rate⁷, labor force growth⁸, population stock⁹, and population growth¹⁰. The first measure is deemed the most accurate in capturing a country's labor force. However, since that data are not available until 1990, we also consider the working age population as a percentage of total population in order to examine a longer time series.

Studies that include labor skill as a primary driver of FDI are not as extensive as ones that consider other classical determinants, even though a high level of human capital, as a key factor to increase production efficiency, is considered attractive by foreign investors in the theoretical literature. The

⁵ Noorbakhsh, Paloni, & Youssef (2001), Quazi, (2007), Ranjan & Agrawal (2011), Shahmoradi & Baghbanyan (2011), Williams (2015), Yasmin, Hussain, & Chaudhary (2003), Al-Sadig (2009), and Busse & Hefeker (2007)

⁶ Noorbakhsh, Paloni, & Youssef (2001), Shahmoradi & Baghbanyan (2011), Neumayer & Spess, 2005; Kok & Acikgoz Ersoy (2009), Al-Sadig (2009)

⁷ Shahmoradi & Baghbanyan (2011)

⁸ Noorbakhsh, Paloni, & Youssef (2001)

⁹ Shahmoradi & Baghbanyan (2011), Neumayer & Spess (2005), Kok & Acikgoz Ersoy (2009)

¹⁰ Al-Sadig (2009)

problem is due to the lack of a precise measurement for labor skill (Noorbakhsh, Paloni, & Youssef, 2001). Widely used indicators as proxies for human capital which have been found to be significant are secondary school enrollment¹¹ and literacy rate¹². As argued by Al-Sadig (2009) and according to Noorbakhsh, Paloni, & Youssef (2001), secondary education is regarded as the most important element in human resource development. This is because it completes the provision of basic education that began at the primary level, and aims at laying the foundations for lifelong learning and human development, by offering more subject- or skill-oriented instruction using more specialized teachers. Thus, we focus on secondary school enrollment as a proxy for human capital.

Gemmell (1996), on the other hand, argues that secondary school enrollment is not the best measurement of human capital because it does not measure the stock of human capital but rather the flow of human capital. Noorbakhsh, Paloni, & Youssef (2001) use an indicator created by Nehru, Swanson, and Dubey (1995) to specifically measure the human capital stock, which they found to be significant. As this data set is not easily available, Noorbakhsh, Paloni, & Youssef (2001) suggest considering the Barro&Lee education data set as a substitute, since both data sets are highly correlated. The disadvantage of the Barro&Lee education data lies in its time gaps, since the data are only available every 5 years. However, it provides measures such as the average years of schooling and percentage of the population that completes secondary education, which capture the education level of a country in a more precise way than gross secondary enrollment levels.

c. Infrastructure

Infrastructure, like macroeconomic stability, inflation, and trade openness, is also a classical variable used in studying FDI¹³, as it is arguably an important precondition for efficiency seeking investment. The low quality of infrastructure in developing countries is not favorable to investors because it increases both production and transportation costs and reduces efficiency. Quality infrastructure can also indicate a richer consumer base of the host country. Thus, a host country with better infrastructure is preferred by investors.

Proxies for infrastructure that have been found to be significant are electric power consumption¹⁴, mobile cellular subscriptions¹⁵, electric power transmission and distribution losses¹⁶, internet¹⁷, and fixed telephone subscriptions¹⁸. Fixed telephone subscriptions has been used predominantly in many studies (Asiedu, 2006; Majocchi & Strange, 2007; Ranjan & Agrawal, 2011; Williams, 2015). However, considering the fact that information technology has advanced incredibly since the last decade, using this measurement as a proxy for infrastructure given this study's time frame seems flawed. Out of the four remaining indicators, we find mobile cellular subscriptions and electric power transmission and distribution losses (% of output) the most appropriate, given that these indicators have less missing data than the others.

¹¹ Yasmin, Hussain, & Chaudhary (2003), Al-Sadig (2009), Noorbakhsh, Paloni, & Youssef (2001)

¹² Asiedu (2006)

¹³ Asiedu (2006); Shahmoradi & Baghbanyan (2011); Quazi (2007); Adams (2010); Asiedu (2006); Majocchi & Strange (2007); Ranjan & Agrawal (2011); Jiménez (2011)

¹⁴ Ranjan & Agrawal (2011)

¹⁵ Quazi (2007); Shahmoradi & Baghbanyan (2011)

¹⁶ Jiménez (2011)

¹⁷ Kok & Acikgoz Ersoy (2009)

¹⁸ Asiedu (2006), Majocchi & Strange (2007), Ranjan & Agrawal (2011), Williams (2015)

d. Natural Resources

Many African and Latin American countries are considered to be an attractive destination for resource seeking investors, due to their large amounts of natural resources which act as a pulling factor for FDI (Asiedu, 2006; Montero, 2008). As these countries represent a large group of developing countries, it is important to investigate the impact of natural resources on the amount of FDI received by host countries. A study done by Neumayer & Spess (2005) used mineral rents (% of GDP) as a proxy for natural resources, while Asiedu (2006) and Montero (2008) used fuel exports as a percentage of merchandise exports. Both indicators capture the availability of natural resources and are found to be significant drivers of FDI. Since data are more available for the latter measure, we follow the work of Asiedu (2006) and Montero (2008) and use fuel exports as a percentage of merchandise exports as a proxy for natural resources.

e. Financial Development Level

As the structure of FDI shifts from natural resources to efficiency seeking incentives, the role of financial development becomes more important for several reasons. Once efficiency seeking investors determine the inefficient market they want to engage in, their construction of production facilities requires financial guarantees. As a result, efficiency seeking investors would prefer a freer and more developed financial market to diminish financial risk (Gouidar & Noura, 2014). Secondly, MNEs also rely on domestic industries within the host country for inputs and intermediate products, and countries with a more developed financial market will promise a faster establishment of these backward linkages (Alfaro, Chanda, Kalemli-Ozcan, & Sayek, 2004). Therefore, host countries with well-developed financial markets will be more attractive to investors.

Empirically, financial development has been studied both separately as a determinant of FDI and as one of the many drivers of FDI¹⁹. Albulescu, Briciu, & Coroiu (2010) in studying the impact of the financial market on FDI consider a vast number of financial variables²⁰ and find that financial development has a significant impact on FDI. One of the variables used by Albulescu, Briciu, & Coroiu (2010), interest spread, was also used in the study by Brada, Kutan, & Yigit (2006) and found to be statistically significant. Additionally, Gouidar & Noura (2014), Githaiga, Nyauncho, & KABIRU (2015), and Noorbakhsh, Paloni, & Youssef (2001) all find domestic credit to the private sector statistically significant as a proxy for financial development, arguing that domestic credit to the private sector represents the opposite of stagnation in the financial market, and is therefore an appropriate measurement of financial development.

Among the different proxies for financial development, we find domestic credit to the private sector more appropriate given the developing countries we are studying, as it captures more fully the theoretical arguments for financial development: the openness level of the host country's financial market, the availability of financial support for private companies, and implicitly the financial development of the host country. Therefore, we believe it to be a better measure than interest spread for the development level of the financial sector.

¹⁹ Gouidar & Noura (2014), Githaiga, Nyauncho, & KABIRU (2015), Alfaro, Chanda, Kalemli-Ozcan, & Sayek (2004); Albulescu, Briciu, & Coroiu (2010); Brada, Kutan, & Yigit (2006); Noorbakhsh, Paloni, & Youssef, (2001)

²⁰ These include market capitalization (% of GDP), current account deficit (% of GDP), banking reform & interest rate liberalization, interest rate spread, etc.

IV. Model Specification

Given the framework introduced by Dunning and the existing empirical literature, this study will adopt the following regression model to investigate the determinants of FDI:

$$FDI = \beta_0 + \beta_1 FIN + \beta_2 MKSZ + \beta_3 STAB + \beta_4 TRADE + \beta_5 INFRA + \beta_6 NATS + \beta_7 LBFC + \beta_8 LBSK + \varepsilon$$

where,

FDI	is foreign direct investment	Expected signs
FIN	is financial development level	+
MKSZ	is market size	+
STAB	is macroeconomic stability	+
TRADE	is level of trade openness	+
INFRA	is infrastructure	+
NATS	is natural resources	+
LBFC	is quantity of labor resource (labor force)	+
LBSK	is quality of labor resource (labor skill)	+

The choice of FDI measurement varies vastly across empirical studies and includes FDI stock²¹, logged FDI inflows²², logged real FDI inflows²³, logged FDI per capita²⁴, FDI inflows as a percentage of GDP²⁵, and logged FDI inflows as a percentage of GDP²⁶. Of these measurements, the two that are used predominantly in the empirical literature are logged FDI inflows and FDI inflows as a percentage of GDP.

For the scope of this study, we adopt logged FDI inflows as a percentage of GDP to be the proxy for the dependent variable. Because our focus is developing countries, where the sizes of the economies vary a great deal, one needs to be aware of the possibility of large country effects, which can skew the distribution of FDI and create less robust results. Thus, without diminishing the importance of FDI, we divide FDI inflows by the country’s GDP (FDIGDP) to smooth out a possibly skewed distribution and take the natural logarithm of FDIGDP to linearize the relationship between FDIGDP and the independent variables.

V. Data

Three decades ago, total FDI inflows to Latin American and African countries contributed to the majority of FDI inflows into developing countries, with investors mainly seeking natural resources. However, with the rise of China, India, and some South East Asian countries in the beginning of the 1990s, FDI inflows shifted away from Latin American towards Asian countries. Furthermore, in the 1990s, FDI inflows to developing countries showed a sectoral shift, away from primary resources and traditional manufacturing towards service and knowledge – capital intensive manufacturing. To

²¹ Stock Nunnenkamp & Spatz (2002), Bénassy-Quéré, Coupet, & Mayer (2007)

²² Ranjan & Agrawal (2011), Kapuria-Foreman (2007)

²³ Neumayer & Spess (2005)

²⁴ Al-Sadig (2009), Kolstad & Villanger (2008), Busse & Hefeker (2007)

²⁵ Noorbakhsh, Paloni, & Youssef (2001), Asiedu (2006), Williams (2015), Montero (2008)

²⁶ Krifa-Schneider & Matei (2010)

investigate this shift away from resource seeking to market and efficiency seeking, we consider two time spans in this study: 1990 – 2014 and 1980 – 2014.

As stated previously, the focus of this study is developing countries²⁷, which can be quite diverse. We thus consider as large a group of developing countries as possible, spanning different regions of the world, based on data availability. Specifically, we include countries from Africa, Asia, Latin and South America and the Caribbean, Eastern Europe, the Middle East, and the Pacific Ocean.

Due to lack of consistently available data, we actually apply the empirical model to 3 different data sets: 1990, 1980, and Barro&Lee. All 3 data sets include all developing countries for which data are available and, wherever possible we use the same indicators for all of the FDI determinants. Unfortunately, of the eight determinants we consider in our model, there are three measures that do not extend before 1990. Thus, the 1990 data set contains all the preferred measures (except for labor skill), while the 1980 data set contains substitutes for the unavailable measures. The Barro&Lee data set instead contains a preferred measure for labor skill.

The following sections discuss each data set in more detail. All of the measures used in our study are obtained from the World Development Indicators of the World Bank, except for *percentage of population aged 15 and over having completed secondary education*, which is obtained from the Barro&Lee education data set. The countries included in each data set are listed in Table 1, while data sources and variables are summarized in Table 2.

a. 1990 Data Set

This data set contains the more appropriate indicators for all determinants except for labor skill. Those indicators are *domestic credit to private sector (% of GDP)* for financial development, *inflation, GDP deflator (annual %)* for macroeconomic instability, *trade (% GDP)* for trade openness, *fuel exports (% of merchandise exports)* for natural resources, *GDP per capita, purchasing power parity (PPP) (constant 2011 international \$)* for market size, *mobile cellular subscriptions (per 100 people)* for infrastructure, and *labor force participation rate, total (% of total population ages 15+)* for labor force. Moreover, we measure labor skill by *school enrollment, secondary (% gross)*. Based on data availability, this data set includes 45 countries and spans 25 years from 1990 to 2014. There are 10 more African countries in this data set than in the 1980 data set, while the number of countries from other regions are similar across the data sets.

b. 1980 Data Set

This data set includes 30 countries with a time series spanning 35 years from 1980 to 2014. In order to extend the 1990 time series by 10 years, we needed to change some of the indicators used for certain determinants. Specifically, the variables used to measure market size, infrastructure, and labor force are changed to *GDP per capita (constant 2010 US\$)*, *electric power transmission and distribution losses (% of output)*, and *population ages 15-64 (% of total)*. Due to the unavailability of data for *GDP per capita, (PPP) (constant 2011 international \$)* before 1990, we use the indicator *GDP per capita (constant 2010 US\$)* as a substitute since it is highly correlated with the original

²⁷ We followed the World Bank classification of developing countries, ones with GNI per capita of less than or equal to \$12,475. Particularly, developing countries are ones whose economies are categorized as low (\$1,025 or less), lower-middle (\$1,026 - \$4,035), and upper-middle (\$4,036 - \$12,475) income.

measure. For the same reason, *labor force participation rate, total (% of total population ages 15+)* is replaced with an indicator representing the working age population, *population ages 15-64 (% of total)*. The measurement for infrastructure, *electric power transmission and distribution losses (% of output)*, substitutes *mobile cellular subscriptions (per 100 people)* to represent the development of hard infrastructure, as compared to the latter which captures the development of communication and technology. For all the other determinants, the variables used are the same as those of the 1990 data set.

c. Barro&Lee Data Set

In both data sets above, *school enrollment, secondary (% gross)* is used as the human capital proxy. In this data set, instead, we use the indicator *percentage of population aged 15 and over having completed secondary education* from the Barro&Lee education data set to measure human capital. This indicator captures the level of human capital of developing countries better than secondary education enrollment because it measures the stock of human capital instead of the flows. This data set contains 34 countries across different regions, which are distributed similarly to the 1980 data set, and spans the years 1980 – 2014. However, because the Barro&Lee education data are only available every 5 years, this data set contains only 7 periods. All of the other variables, which are measured using the same proxies as the 1980 data set and are available yearly, are averaged every 5 years to fit with the setup of the Barro&Lee data.

Descriptive statistics for all data sets are presented in Tables 3, 4, and 5. Average FDI as a percentage of GDP is about 2% for the 1980 data set and 3% for the 1990 data set, with respective standard deviations of 3.06 and 2.42. Though China is the largest FDI recipient in the world, it is not the largest recipient of FDI relative to economy size. Its FDI inflows peaked at 6.21% in 1993 and have fluctuated between 3% - 6% ever since. Across all data sets and periods, Jordan is the largest recipient of FDI relative to its economy size, receiving approximately 23.53% in 2006, followed by Panama which received 16.23% in the same year. Interestingly, Panama is also the country with the least amount of FDI inflows out of all countries, receiving -11.53% in 1988²⁸. Of the countries with only positive FDI inflows as a percentage of GDP, Algeria and Bangladesh received the least amount of FDI inflows, roughly 0%, for most of the period 1980 – 1995. When considering FDI inflows as percentage of GDP, most Asian countries have not been the largest recipients of FDI, but some Asian countries such as Thailand, India, Malaysia, and China have had the more stable FDI inflows since 1980. The average FDI inflows as a percentage of GDP for Thailand, India, Malaysia, and China are 2.3%, 0.8%, 3.97% and 2.79% respectively.

VI. Methodology

To avoid spurious estimation, we employ six unit root tests²⁹ to investigate the stationarity of all variables in both the 1990 and 1980 data sets. Since the Barro&Lee data set has time gaps, unit root tests are not applicable. Our stationary test results are presented in Tables 6 and 7. Based on these test

²⁸ Negative FDI inflows imply that the amount of disinvestment is larger than the amount of FDI flows into the country that year.

²⁹ Levin, Lin and Chu; Im, Pesaran, and Shin; ADF Fisher; Breitung; Hadri; and Harris-Tzavalis

results, the variables are either expressed in levels or first order differences depending on which transformation is stationary^{30/31}.

Our study investigates three different data sets, all of which are panel data. Thus, we consider three regression models: pooled OLS, fixed effects, and random effects. Since our data sets contain 30 countries or more, the unobserved individual heterogeneity could be better addressed by using the fixed effects model to cover the possible correlation between the heterogeneity and the independent variables. We run the Hausman test for all regressions to check whether the fixed effects or random effects model is more efficient. Based on these test results, we apply the fixed effects model to the 1980 and the Barro&Lee data sets, while the random effects model is applied to the 1990 data set. Moreover, the F-tests confirm that the fixed effects model is more appropriate than pooled OLS for both the 1980 and Barro&Lee data sets, while the Breusch Pagan Lagrange Multiplier test confirms that the random effects model is more appropriate than pooled OLS for the 1990 data set. These test results are presented in Table 8.

VII. Results

All of the regression results for the different data sets are presented in Table 9. The first column reports the fixed effects model regression results for the 1980 data set, which, despite using less appropriate proxies for market size, infrastructure, and labor force, allows for a much larger time span. As the results indicate, the coefficients for trade openness, infrastructure, natural resources, and labor force are all significant and have the predicted signs. Particularly, countries with higher trade levels, better infrastructure³², more abundant natural resources, and a larger labor force are more attractive to investors. On the other hand, the coefficients for macroeconomic stability, labor skill, financial development, and especially market size, are not significant.

The fact that the coefficients for both labor force and natural resources are significant and positive, while for labor skill it is not, reinforces the importance of the resource seeking over market or efficiency seeking characteristic of foreign investment to developing countries during the period 1980 – 2014. Indeed, the coefficient for labor force is significant at the 1% level while the other significant coefficients are only so at the 10% level. Thus, labor force is the leading determinant of FDI for this data set. In addition, the insignificance of the coefficient for market size further supports the fact that market seeking FDI was not the prominent type of FDI during this period. However, the market size variable for the 1980 data set is measured with a less appropriate proxy. Since labor force is measured by working age population, this proxy for labor force could also diminish the significance of market size, as the working age population could also be considered a proxy for market size.

Column 2 of Table 9 reports the random effects model regression results for the 1990 data set, which includes the improved proxies for market size, infrastructure, and labor force. Though the magnitude is rather small, the coefficient for market size is significant with a positive sign.

³⁰ Variables which are first order differenced to obtain stationary for the 1980 data set are domestic credit to private sector, GDP per capita, trade, electric power transmission and distribution losses, and gross secondary school enrollment. All other variables are expressed in levels.

³¹ Variables which are first order differenced to obtain stationary for the 1990 data set are domestic credit to private sector, GDP per capita (PPP), mobile cellular subscriptions, gross secondary school enrollment, and labor force participation rate. All other variables are expressed in levels.

³² Since the proxy for infrastructure in this data set is electric power transmission and distribution losses, a negative coefficient for the variable implies a positive effect of infrastructure on FDI.

Macroeconomic stability³³, trade openness, labor skill, and infrastructure all have significant coefficients as well, with the predicted signs. On the other hand, the coefficients for financial development, natural resources, and labor force participation are not significant. These findings from the 1990 data set suggest that a larger consumer base, less macroeconomic instability, more trade openness, higher quality of labor, and better infrastructure all promote FDI.

In both the 1990 and 1980 data sets, two consistently significant variables are trade openness and infrastructure. Interestingly, infrastructure shows a significant and positive impact on FDI inflows into developing countries both when measured by hard infrastructure in the 1980 data set and by telecommunications in the 1990 data set. These findings imply that it is crucial for developing countries to lower their trade barriers and invest in all types of infrastructure to attract FDI inflows.

Comparison of the regression results between the 1990 and 1980 data sets also indicate a sectoral shift in FDI inflows. The regression results for the extended period 1980 – 2014 reveal that market size, labor skill, and macroeconomic stability are all not important determinants of FDI, but they do play a substantial role during the period 1990 – 2014. On the other hand, labor force and natural resources are significant determinants of FDI during the extended period 1980 – 2014, but not during the period 1990 – 2014. All of these differences indicate that FDI investment may have shifted away from primary product industries after the 1990s. Moreover, such changes in FDI determinants signal a transition in investors' incentives from resource seeking to market and efficiency seeking.

Column 3 of Table 9 presents the fixed effects model regression results for the Barro&Lee data set, where all the data are averaged every 5 years except for the labor skill proxy. This data set substitutes the flow proxy for labor skill, gross secondary enrollment, with a stock measure, the percentage of the population having completed secondary school, but keeps the same proxies as the 1980 data set for all other variables. For this data set, only labor force and trade openness are found to be significant determinants of FDI with the appropriate signs. Despite a better proxy, labor skill is still insignificant for the period 1980 – 2014, while labor force remains strongly significant at the 1% level. This finding reinforces that human capital is possibly a less important factor prior to the 1990s. Furthermore, the coefficient for trade openness is consistently significant also for this data set, fortifying the importance of economic openness as an FDI determinant.

VIII. Conclusion

In our paper, we examine the determinants that make developing countries more attractive as a destination for FDI. Our findings are in line with the observed global trend of a sectoral change in FDI during the 1990s. Since 1990, human capital, macroeconomic stability, and market size have all had a statistically significant impact on FDI inflows into developing countries. When extending the time span to 1980 – 2014, we find that natural resources and labor force are crucial determinants of FDI, while human capital, macroeconomic stability, and market size are not. Thus, investment from 1990 till nowadays has shifted away from primary products and more towards service and knowledge – capital intensive manufacturing industries. More importantly, across time spans and proxies, infrastructure and trade are proven to be critical factors driving FDI flows.

³³ Since macroeconomic stability is measured by the level of inflation, a decrease in inflation attracts more FDI inflows.

Unfortunately, financial development is not found to be an important determinant despite a sound theoretical argument. We expect that better measurements and a longer time span into the future could eventually lead to the significance of this factor. Moreover, our research is restricted to traditional determinants of FDI. Political and institutional variables may also determine the flow of FDI as those variables indicate locational advantages of the host countries, but these data are only available after 1998.

Our analysis and findings suggest that developing countries will benefit from trade openness and quality infrastructure. The more a country trades, the more FDI inflows it attracts. Similarly, better infrastructure, which incentivizes efficiency seeking investment, has been especially compelling to FDI investors in recent decades. Furthermore, as the economies of these countries become more sophisticated, a human capital stock and large consumer base are fundamental conditions to maintain inflows of FDI.

Appendix

Table 1. *Data Sets and Countries*

Data Set	N	T	Countries
1990 - 2014	45	25	<p><i>(21 African countries)</i></p> <p>Algeria, Botswana, Burkina Faso, Cameroon, Arab Rep. of Egypt, Ghana, Kenya, Malawi, Mali, Mauritius, Morocco, Niger, Nigeria, Rwanda, Senegal, South Africa, Sudan, Togo, Tunisia, Uganda, Zimbabwe</p> <p><i>(8 Asian countries)</i></p> <p>Bangladesh, China, India, Indonesia, Malaysia, Pakistan, Philippines, Thailand</p>
			<p><i>(13 Latin, Central American, and Caribbean countries)</i></p> <p>Belize, Bolivia, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Jamaica, Mexico, Panama, Paraguay, St. Lucia</p> <p><i>(3 other countries)</i></p> <p>Fiji, Turkey, Jordan</p>
1980 - 2014	30	35	<p><i>(11 African countries)</i></p> <p>Algeria, Cameroon, Arab Rep. of Egypt, Ghana, Kenya, Mauritius, Morocco, Nigeria, Senegal, Tunisia, Zimbabwe</p> <p><i>(8 Asian countries)</i></p> <p>Bangladesh, China, India, Indonesia, Malaysia, Pakistan, Philippines, Thailand</p>
			<p><i>(9 Latin, Central American, and Caribbean countries)</i></p> <p>Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Jamaica, Mexico, Panama</p> <p><i>(2 other countries)</i></p> <p>Jordan, Turkey</p>
Barro&Lee	34	7	<p><i>(12 African countries)</i></p> <p>Algeria, Cameroon, Arab Rep. of Egypt, Ghana, Kenya, Mauritius, Morocco, Senegal, South Africa, Togo, Tunisia, Zimbabwe</p> <p><i>(9 Asian countries)</i></p> <p>Bangladesh, China, India, Indonesia, Malaysia, Pakistan, Philippines, Sri Lanka, Thailand</p>
			<p><i>(11 Latin, Central American, and Caribbean countries)</i></p> <p>Colombia, Costa Rica, Cote d'Ivoire, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Jamaica, Mexico, Panama</p> <p><i>(2 other countries)</i></p> <p>Jordan, Turkey</p>

Table 2. *Data Sources and Measurements*

Determinant	Variable	Measurement	Abbreviation	Data Sources
FDI	Dependent	Foreign direct investment, net inflows (% of GDP)	FDIGDP	World Bank
Financial Development	Financial development	Domestic credit to private sector (% of GDP)	DOMCRD	World Bank
Market Size	GDP per capita	GDP per capita (constant 2010 US\$)	GDPCAP	World Bank
		GDP per capita, PPP (constant 2011 international \$)	GDPPPP	
Macroeconomic Factors	Stability	Inflation (GDP deflator)	INFL	World Bank
Trade Openness	Trade level	Exports plus imports (% of GDP)	TRADE	World Bank
Infrastructure	Infrastructure capability	Electric power transmission and distribution losses (% of output)	ELEC	World Bank
		Mobile cellular subscriptions (per 100 people)	MOBILE	
Natural Resources	Natural resources	Fuel exports (% of merchandise exports)	FUELEX	World Bank
Labor Factors	Labor force	Labor force participation rate, total (% of total population ages 15+)	LBFC	World Bank
		Population ages 15-64 (% of total)	WORKPOP	
	Labor skill	School enrollment, secondary (% gross)	EDUFLOW	World Bank
		Secondary education completion (% of total population ages 15+)	EDUSTOCK	Barro&Lee

Table 3. *Descriptive Statistics (1980 Data Set)*

Variable	Obs.	Mean	Std. dev.	Min	Max
FDIGDP	1044	1.987084	2.416973	-11.53026	23.53736
GDPCAP	1050	3116.338	2299.442	344.6272	11246.14
INFL	1050	11.30402	16.55893	-27.04865	139.6588
TRADE	1046	67.48552	36.62216	6.320343	220.4073
EDUFLOW	857	54.77825	21.50888	7.7524	120.3267
ELEC	1020	15.0213	7.112403	0	49.26698
DOMCRD	1035	38.35254	29.25674	1.542268	166.5041
FUELEX	963	17.94059	26.24519	.0000754	99.6565
WORKPOP	1050	58.75293	5.746506	46.95173	74.35314

Table 4. Descriptive Statistics (1990 Data Set)

Variable	Obs.	Mean	Std. dev.	Min	Max
FDIGDP	1122	2.742811	3.062411	-6.89768	23.53736
GDPPPP	1125	6396.313	4479.931	485.8201	24459.78
INFL	1125	9.809856	15.44626	-27.04865	159.267
TRADE	1120	71.57953	35.89428	11.08746	220.4073
EDUFLOW	861	56.30311	24.85612	6.24449	120.3267
MOBILE	1122	31.67029	41.54509	0	180.6992
DOMCRD	1104	38.71318	33.0289	1.615531	166.5041
FUELEX	1009	14.24107	23.78299	0	99.6565
LBFC	1125	64.3824	10.95703	39.2	89

Table 5. Descriptive Statistics (Barro&Lee Data Set)

Variable	Obs.	Mean	Std. dev.	Min	Max
FDIGDP	238	1.921737	2.057159	-3.667731	15.52454
GDPCAP	266	3152.128	2430.382	366.0883	11525.63
INFL	266	59.44121	334.8055	-6.21548	3858.509
TRADE	266	66.77445	34.48819	12.876	205.5394
EDUSTOCK	266	1.791867	.8417948	.3872252	4.58179
ELEC	266	15.21994	7.511574	0	72.82682
DOMCRD	265	39.08064	29.39362	1.918805	148.3103
FUELEX	261	14.29461	20.93473	.0007323	98.04257
WORKPOP	266	58.65933	5.650175	46.98969	74.09593

Table 6. Panel Unit Root Tests (1980 Data Set)

Variables	Panel Unit Root Tests	Levels	First Order Differences
		Test Statistic	Test Statistic
ln FDIGDP	Levin, Lin, and Chu	NA	NA
	Im, Pesaran, and Shin	-6.3856***	--
	ADF Fisher	118.7700***	--
	Breitung	NA	NA
	Hadri	NA	NA
	Harris-Tzavalis	NA	NA
	GDPCAP	Levin, Lin, and Chu	11.1179
Im, Pesaran, and Shin		20.1632	-11.0886***
ADF Fisher		8.3812	252.5382***
Breitung		16.2357	-5.9328***
Hadri		108.3527***	16.4613***
Harris-Tzavalis		1.0367	0.2499***
INFL		Levin, Lin, and Chu	-6.3293***
	Im, Pesaran, and Shin	-13.3801***	--
	ADF Fisher	241.0470***	--
	Breitung	-5.0451***	--
	Hadri	29.4189***	--
	Harris-Tzavalis	0.4446***	--

TRADE	Levin, Lin, and Chu	-2.2672**	-16.2779***
	Im, Pesaran, and Shin	-0.9462	-17.8670***
	ADF Fisher	71.1832	559.4182***
	Breitung	-1.1563	-12.6465***
	Hadri	66.0675***	-1.2802
	Harris-Tzavalis	0.8824**	-0.0304***
EDUFLOW	Levin, Lin, and Chu	NA	NA
	Im, Pesaran, and Shin	13.7750	-8.7191***
	ADF Fisher	12.5123	156.9582***
	Breitung	NA	NA
	Hadri	NA	NA
	Harris-Tzavalis	NA	NA
ELEC	Levin, Lin, and Chu	-0.3924	-13.8949***
	Im, Pesaran, and Shin	-2.4595***	-19.4098***
	ADF Fisher	50.6923	570.9633***
	Breitung	-2.3562***	-12.6380***
	Hadri	52.8001***	-2.4006
	Harris-Tzavalis	0.7899***	-0.3018***
DOMCRD	Levin, Lin, and Chu	NA	NA
	Im, Pesaran, and Shin	4.0768	-15.3183***
	ADF Fisher	54.8729	382.0041***
	Breitung	NA	NA
	Hadri	NA	NA
	Harris-Tzavalis	NA	NA
FUELEX	Levin, Lin, and Chu	NA	NA
	Im, Pesaran, and Shin	-4.7701***	--
	ADF Fisher	191.9450***	--
	Breitung	NA	NA
	Hadri	NA	NA
	Harris-Tzavalis	NA	NA
WORKPOP	Levin, Lin, and Chu	-10.4010***	-0.1447
	Im, Pesaran, and Shin	6.7166	1.0506
	ADF Fisher	150.6813***	58.4743
	Breitung	21.1176	-0.0964
	Hadri	115.8013***	39.3851***
	Harris-Tzavalis	0.9915	0.8958

Notes: For all tests, the null hypothesis is that panels contain a unit root, except for the Hadri test whose null hypothesis is that all panels are stationary. Only the Im, Pesaran, and Shin and ADF Fisher tests are applicable to unbalanced time series. Stationarity is only checked for first order difference if the levels are non-stationary.

*Significance at the 10% level.

**Significance at the 5% level.

***Significance at the 1% level.

Table 7. Panel Unit Root Tests (1990 Data Set)

Variables	Panel Unit Root Tests	Levels Statistic	First Order Differences Statistic
ln FDIGDP	Levin, Lin, and Chu	NA	NA
	Im, Pesaran, and Shin	-8.7268***	--
	ADF Fisher	283.4389***	--
	Breitung	NA	NA
	Hadri	NA	NA
	Harris-Tzavalis	NA	NA
GDPPPP	Levin, Lin, and Chu	7.8507	-7.2869***
	Im, Pesaran, and Shin	17.5275	-12.2792***
	ADF Fisher	28.5076	285.9393***
	Breitung	16.9830	-7.6521***
	Hadri	93.8330***	7.7361***
	Harris-Tzavalis	1.0255	0.1294***
INFL	Levin, Lin, and Chu	-12.6973***	--
	Im, Pesaran, and Shin	-12.8666***	--
	ADF Fisher	438.9339***	--
	Breitung	-7.5117***	--
	Hadri	31.2093***	--
	Harris-Tzavalis	0.4517***	--
TRADE	Levin, Lin, and Chu	-2.7310***	-16.2144***
	Im, Pesaran, and Shin	-1.9475**	-17.7009***
	ADF Fisher	89.0576	611.9614***
	Breitung	-1.7698**	-16.6460***
	Hadri	48.2042***	-1.6494
	Harris-Tzavalis	0.7907***	-0.1846***
EDUFLOW	Levin, Lin, and Chu	NA	NA
	Im, Pesaran, and Shin	11.4530	NA
	ADF Fisher	45.1980	147.0865***
	Breitung	NA	NA
	Hadri	NA	NA
	Harris-Tzavalis	NA	NA
MOBILE	Levin, Lin, and Chu	NA	NA
	Im, Pesaran, and Shin	29.0531	-4.0588***
	ADF Fisher	33.3889	109.5309*
	Breitung	NA	NA
	Hadri	NA	NA
	Harris-Tzavalis	NA	NA
DOMCRD	Levin, Lin, and Chu	NA	NA
	Im, Pesaran, and Shin	3.7699	-13.8690***
	ADF Fisher	161.6685***	500.8613***
	Breitung	NA	NA
	Hadri	NA	NA
	Harris-Tzavalis	NA	NA

FUELEX	Levin, Lin, and Chu	NA	NA
	Im, Pesaran, and Shin	-2.5230***	--
	ADF Fisher	179.8638***	--
	Breitung	NA	NA
	Hadri	NA	NA
	Harris-Tzavalis	NA	NA
LBFC	Levin, Lin, and Chu	-6.0963***	-5.7365***
	Im, Pesaran, and Shin	1.1980	-8.8187***
	ADF Fisher	124.7341***	304.6129***
	Breitung	7.5511	-7.9389***
	Hadri	80.5125***	6.8494***
	Harris-Tzavalis	0.9456	0.2272***

Notes: For all tests, the null hypothesis is that panels contain a unit root, except for the Hadri test whose null hypothesis is that all panels are stationary. Only the Im, Pesaran, and Shin and ADF Fisher tests are applicable to unbalanced time series. Stationarity is only checked for first order difference if the levels are non-stationary.

*Significance at the 10% level.

**Significance at the 5% level.

***Significance at the 1% level.

Table 8: *Fixed/Random Effects versus Pooled OLS Model Tests*

	1980 Data Set	1990 Data Set	Barro&Lee Data Set
Observations	642	639	226
Countries	30	45	34
Period	1980 – 2014	1990 – 2014	1980 – 2014 (5 year averages)
F – Test (FE vs Pooled)	17.92***		4.98***
Breusch and Pagan Lagrangian Multiplier Test (RE vs Pooled)		344.08***	
Hausman Test (FE vs RE)	23.92***	5.88	20.15***

Notes: Numbers reported are the test statistics. The Hausman tests are calculated using the estimated disturbance variance from the efficient estimator.

*Significance at the 10% level.

**Significance at the 5% level.

***Significance at the 1% level.

Table 9. Regression Results

Dependent Variable ln FDIGDP		1980 Data Set Fixed effects	1990 Data Set Random effects	Barro&Lee Fixed effects
Market Size	GDPCAP	5.67E - 04 (1.48)		-.0002 (-1.23)
	GDPPPP		3.75E-04* (1.68)	
Macroeconomic Stability	INFL	7.36E - 04 (0.19)	-.0114*** (-2.71)	-.0028 (-0.41)
Trade Openness	TRADE	.0130* (1.76)	.0113*** (3.05)	.0126** (2.39)
Labor Skill	EDUFLOW	.0122 (0.79)	.0333** (2.17)	
	EDUSTOCK			.0267 (1.56)
Infrastructure	ELEC	-.0191* (-1.72)		-.0008 (-0.04)
	MOBILE		.0239*** (4.26)	
Financial Development	DOMCRD	1.85E - 03 (0.35)	-.0026 (-0.34)	-.0041 (-0.81)
Natural Resources	FUELEX	.0119* (1.87)	.0057 (1.29)	.0098 (1.17)
Labor Force	WORKPOP	.1941*** (4.70)		.1789*** (4.39)
	LBFC		-7.99E-04 (-0.01)	
Constant		-11.7468*** (-4.71)	-90.4215 (-1.24)	-10.9596*** (-5.97)
Observations		642	639	226
Countries		30	45	34
Period		1980 – 2014	1990 – 2014	1980 – 2014 (5 year average)
F – Test/Wald Test (model)		7.41***	62.29***	12.75***
Within R-squared		0.3351	0.1283	0.4440
Between R-squared		0.0761	0.2661	0.0916

Notes: Standard errors are adjusted for heteroscedasticity and autocorrelation through cluster-robust VCE estimators provided by STATA. t-values are in parentheses. Data sources and definitions of variables are provided in Table 2.

*Significance at the 10% level.

**Significance at the 5% level.

***Significance at the 1% level.

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