The Investment Development Path: Is It Relevant For Designing Foreign Direct Investment Policies?

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Abstract

Foreign Direct Investment (FDI) is often seen as an opportunity for developing countries to spur the growth of their economy. A helpful framework that is often used by policy makers to design FDI policies for developing countries is the investment development path (IDP) constructed by Dunning (1980). However, the empirical research on the IDP framework and inward FDI stocks with respect to the development of the importance of the locational factors over the different stages is limited. In this study it is tested if the IDP framework correctly theorized this development by verifying if there is interaction between economic development and certain FDI locational factors using a fixed effects OLS panel data estimation on data of 107 countries. Based on the results, it can be concluded that the predictions of the IDP related to resource-seeking FDI locational factors are in line with empirical data. However, the predictions of the IDP related to locational factors that are involved in market-seeking, efficiency-seeking, and strategic asset-seeking FDI are not in line with the finding of this study. It is thus questionable if the IDP framework is correct and in line with empirical data and if it should be used to design policies to attract FDI stocks.

Key words: Foreign direct investment, investment development path, eclectic paradigm, international business

Contents

Introduction

Foreign Direct Investment (FDI) is often seen as an opportunity for developing countries to spur the growth of their economy. FDI, as well as other forms of engagement in local economies by multinational enterprises (MNE), may function as a shortcut to structural change and help to break the vicious circle of poverty and underdevelopment. It can play a role as a significant catalyst for output and trade in developing countries and shows potential to deliver important contributions to economic development in terms of investment, employment, and foreign exchange (Narula & Pineli, 2016). Besides this, FDI's spill-over potential—the productivity gain resulting from the diffusion of knowledge and technology from foreign investors to local firms and workers—is seen as the most promising aspect of FDI (Farole & Winkler, 2014).

Many developing countries have therefore adopted policies to increase FDI inflows to their countries. A helpful framework that is often used by policy makers to design FDI policies for developing countries is the investment development path (IDP) constructed by Dunning (1980). IDP is a framework which postulates that the relationship between FDI and economic development of countries can be usefully analysed by categorizing their evolution through five stages (Dunning & Narula, 1996; Narula, 1993). The theory behind the IDP framework is the eclectic paradigm of John Dunning (Dunning, 1958). This theory states that the locational advantages a country has over other countries can explain where a MNE will invest. The IDP framework assumes that the locational advantages of a country change when it develops economically and that therefore also the impact of locational factors on inward FDI change (Dunning & Narula, 1996). Inward FDI are investments made by a foreign MNEs in a host country.

The empirical research on the IDP framework and inward FDI with respect to locational factors is limited in quantity and quality. To the best of the author's knowledge there are only two empirical studies that have focussed on this topic and those two studies show mixed results (Galan, González-Benito, & Zuñiga-Vincente, 2007; Ramírez-Alesón & Fleta-Asín, 2016). Besides this, it is criticized if the IDP framework is still relevant in an ever globalizing world (Dunning, 2001; Narula & Dunning, 2000; 2010; Narula & Peneli, 2016). Globalization might have led to a shift in the motivation for FDI by MNEs. Furthermore, MNEs are using a richer variety of organizational models besides FDI to engage in foreign economies.

In the current study it was tested if the IDP framework is relevant for designing FDI policies based on the IDP of a country. The research question of the study is:

To what degree is the theory that the influence of particular locational factors on inward FDI changes over the different stages of the IDP in line with empirical data?

This question is answered by testing four different hypotheses which are based on the change of the impact of locational FDI factors over the different stages as theorized by the IDP framework. The hypotheses were tested by analysing if there is interaction between economic development and FDI locational factors.

The current study will extends existing literature on the IDP framework by providing empirical evidence if IDP is still relevant in designing policies or that the IDP framework needs revision. The practical interest of this research is that it provides empirical evidence to evaluate if the IDP framework is an useful way to design FDI policies for developing countries.

The paper is structured as follows. In chapter 1, the theoretical framework used in the study is discussed and previous empirical research on the IDP framework and locational factors and inward FDI is shown. In chapter 2, the method and the data that is used to answer the research question is discussed. Then, in chapter 3 the results are described. Subsequently, the results are compared with findings of other studies in chapter 4. Finally, the current study ends with a conclusion in chapter 5.

1. Theoretical Framework

1.1. Foreign direct investment

The Organization for Economic Cooperation and Development (OECD) defined FDI in the *OECD benchmark definition of foreign direct investment* as follows:

> Direct investment is a category of cross-border investment made by a resident in one economy—the direct investor—with the objective of establishing a lasting interest in an enterprise—the direct investment enterprise—that is resident in an economy other than that of the direct investor. The motivation of the direct investor is a strategic long-term relationship with the direct investment enterprise to ensure a significant degree of influence by the direct investor in the management of the direct investment enterprise. The "lasting interest" is evidenced when the direct investor owns at least 10% of the voting power of the direct investment enterprise (OECD, 2008, p.17).

FDI is thus an investment made by a MNE or individual in a business interest in a foreign country. The key feature of FDI is that the goal of the investment is to get effective control of, or at least significantly influence over, the decision making of a foreign enterprise. To make sure that this influence is significant, a direct investor should own at least 10% of the voting power. This study focusses on FDI stocks instead of FDI flows. FDI stocks are defined by the United Nations Conference on Trade and Development (UNCTAD) as follows: "FDI stock is the value of the share of their capital and reserves—including retained profits—attributable to the parent enterprise, plus the net indebtedness of affiliates to the parent enterprise" (UNCTAD, 2016, p.4).

FDI can be made in different ways, for example by opening an associate company in a foreign country, obtaining a controlling interest in existing foreign company, or by a joint venture with a foreign company. FDI is commonly categorized as being horizontal, vertical or conglomerate in nature (Herger & McCorriston, 2014). FDI is horizontal when a MNE invests in a foreign country in the same businesses as in its home country. For example a brewery multinational from the Netherlands which starts a new brewery in Ghana. FDI is vertical when a MNE invests in a foreign county in a different but related business as in it its home country. For example when the brewery multinational from the Netherlands invests in warehouses in Ghana to store and ship ingredients needed for brewery processes from Ghana to the Netherlands. Finally, FDI is conglomerate when a MNE makes a foreign investment in a business that is unrelated to its existing business in its home country. For example when the brewery multinational from the Netherlands invests in a telephone company in Ghana.

FDI may positively influence economic development by playing a role in boosting the output and trade of developing countries. Furthermore, it can increase investments and employment in a country. Besides this, spill/over effects of FDI can positively influence productivity of domestic firm as a result of the diffusion of knowledge and technology from foreign investors (Farole & Winkler, 2014). However, to obtain these positive results, it is important that a country has well designed policies which focus on attracting the right kinds of FDI—FDI that can provide these positive

results—and which focus on making it possible for domestic firms to benefit from the spill-over effects of FDI. In other words, it is not FDI per se that determines economic growth, but the associated knowledge transfer and linkages, and the capacity of domestic firms to absorb, internalise and upgrade their knowledge assets by taking advantage of the spill-overs (Narula & Pineli, 2016).

1.2. The eclectic paradigm

The eclectic paradigm is one of the most dominant operational frameworks in international business economics. It is originally developed by Dunning (1958) as a further development on the internalization theory. Dunning has also further elaborated the eclectic paradigm later on (e.g.: Dunning, 1980; Dunning, 2001). The paradigm is based on the dynamic relationship between a firm's ownership advantages (O), a country's location advantages (L), and internalization advantages (I). The paradigm is therefore also known as the OLI paradigm. These advantages are three potential sources that may underlie a firm's decision to become a multinational and can also explain which country it chooses to invest in by using FDI (Dunning, 1980).

A firm's ownership advantage is the competitive advantage which a firm possesses over other firms. This competitive advantage is based on the extent to which a firm possesses assets which its competitors do not possess (Dunning, 1980). It can explain which firms will engage in FDI. An asset should be seen as something that can generate value in the future. These assets can be applied to production at different locations without reducing their effectiveness. These assets can therefore be used to overcome the costs of operating in a foreign country (Amit & Schoemaker, 1993). Examples of assets are: product development, managerial structures, patents, and marketing skills.

Locational advantages indicates to which extent it is more profitable for a MNE to use its assets in a foreign country instead of in its home country (Dunning, 1980). They are important to answer the question where a MNE chooses to locate (Dunning, 2001). Locational advantages are for example the labour costs in a country, the resource richness of a country, or technological development of a country. If for example a country has relatively low labour costs, this can be a locational advantage for foreign MNEs that use labour intensive manufacturing. These MNEs are therefore more likely to, *ceteris paribus*, engage in FDI in this country.

The internalization advantages contains the competitive advantage of a MNE in organising the generation and use of their assets within their jurisdiction and those they could access in different locations. It influences how a firm chooses to operate in a foreign country (Dunning, 2001). This will result in a trade-off between costs. For example between the holdup and monitoring costs of a new factory in a foreign country, against the advantages or disadvantages of other entry modes such as exports, licensing, or joint venture (Neary, 2008).

1.3. Investment development path

The IDP framework is developed to understand the dynamic relationship between FDI and a country's level of economic development. The basic proposition of the IDP is that a country goes through five stages of investment development. The different stages are related with different volumes and structures of inward and outward FDI stocks, which lead to different values in a country net outward investment position (NOIP). Inward FDI is an investment made by a foreign MNE in a country. Outward FDI is an investment made by a MNE in a foreign country. NOIP is defined as the difference between gross outward direct investment stock and gross inward direct investment stock.

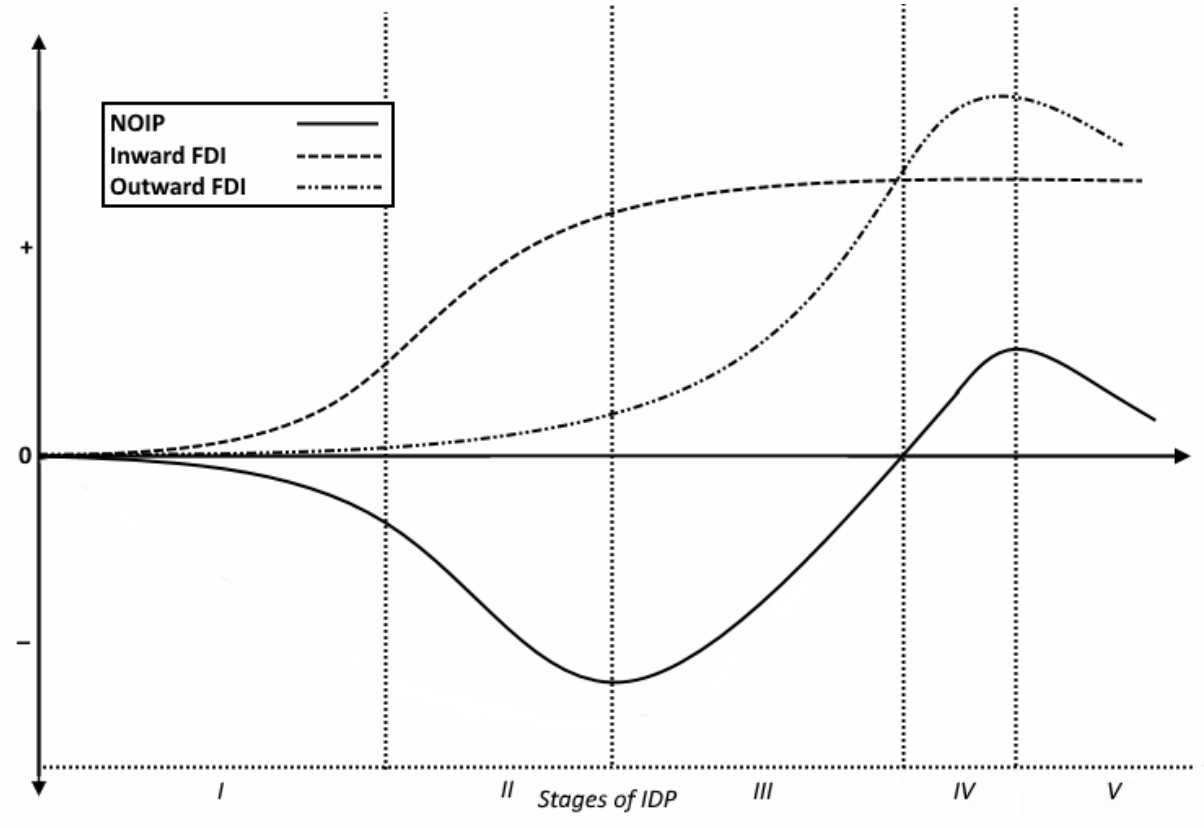

Figure 1. The Development of NOIP, Inward FDI stock, Outward FDI stock when Economic Development increases (not drawn to scale), adapted from "Multinational enterprises, development and globalization, some clarifications and a research agenda." by R. Narula and J.H. Dunning, 2010, *Oxford Development Studies, 38*(3), p. 265

These differences in the levels and types of FDI when a country economically develops are explained by the change in the locational advantages of a country and the change in the ownership advantages of its domestic firms. When a country has low economic development, it is unlikely to have much locational advantages besides natural resource that might be present or its geographical location. Besides this, the domestic firms in this country are unlikely to have any ownership advantages (Dunning & Narula, 2000). If a country starts to economically develop, it is likely that it will get more locational advantages. For example because its market size increased, its labour force became more qualified or its infrastructure has been improved. This increase in locational advantages

is likely to result in increased FDI inflows. In addition, the domestic firms of the country will have grown and obtained more assets. They are therefore likely to have obtained some ownership advantages and will start investing in foreign countries (Dunning & Narula, 2000). This will result in increased levels of FDI outflows. Figure 1 gives an overview of how stocks of inward and outward FDI shift over the different stages and how this affects the NOIP.

1.3.1. Different types of FDI

Since the composition of different forms of FDI in- and outward stocks shift over the five different stages, the impact of some general FDI locational factors change as well between the different stages. The IDP framework distinguishes four different types of FDI (see table 1). These different types of FDI are a based on different motivations for MNEs to become active in a foreign country. These motivations are a result of different locational advantages. The four different types of FDI that are distinguished in the IDP framework are: resource-seeking FDI, market-seeking FDI, efficiency-seeking FDI, and strategic asset-seeking FDI (Dunning & Narula, 2000).

Resource-seeking FDI is motivated by the interest of a MNE to access and exploit primary resources. This form of FDI is therefore mainly driven by the locational advantage in resource richness of a country. A country has a strong locational advantage when it possesses a relatively large stock of a particular scarce resource. However, also factors that make it more profitable to extract resources such as a good infrastructure and low wage costs are important factors that can give a country a locational advantage for the inflow of resource-seeking FDI (Dunning & Narula, 2000).

Market-seeking FDI is motivated by the interest of a MNE to serve a domestic or regional market. This type of FDI can also be seen as horizontal FDI or import substituting FDI. Market-seeking FDI is likely to be driven by the market size of a country, the growth potential of the market and the size of the regional market a country can access. A MNE will be more likely to use this type of FDI when producing abroad is cheaper than producing at home and exporting the product to the host country. This is more likely to be the case when trading costs are high or when producing costs are lower in the host country compared to the home country. Trading costs and production costs are therefore also important factors that can influence the inflow of market-seeking FDI (Dunning & Narula, 2000).

Efficiency-seeking FDI happens when a MNE uses FDI to increase the efficiency of its production. Efficiency-seeking FDI is mainly production costs related. Examples of these costs are labour costs, machinery costs and material costs. Important factors are therefore schooling and health of the labour force, efficiency of good markets, the functioning of labour markets, the development of financial markets, and the technological development of a country. Besides this, agglomerative economies may drive efficiency seeking-FDI because these can provide economies of scale advantages. Also investments incentives such as tax breaks, grants, and subsidies are factors that can drive efficiency-seeking FDI (Dunning & Narula, 2000).

Table 1.

Overview of different types of FDI motives and the associated factors

Type of FDI	*Factors*
Resource-seeking	Resource richness
	Infrastructure
	Low wage costs
Market-seeking	Domestic market size
	Foreign market size
	Market size growth
	Trading costs
	Production costs
Efficiency-seeking	Schooling & health labour force
	Efficiency good markets
	Functioning labour markets
	Development financial markets
	Technological readiness
	Infrastructure
	Agglomerative economies
	Investment incentives
Asset-seeking	Innovation
	Ease of obtaining assets

Strategic asset-seeking FDI are investments with as goal to obtain assets that can provide ownership advantages. It is mainly driven by the availability of knowledge-related assets. Strategic asset-seeking FDI will therefore mainly happen in countries that have firms which have a lot of locational advantages. Another important factor that drives strategic asset-seeking FDI is the ease by which the assets can be obtained by foreign firms (Dunning & Narula, 2000).

These four different types of FDI can be broadly divided in two groups. The first three—resource-seeking, market-seeking, and efficiency-seeking—can be seen as asset-exploiting in nature: that is, the primary goal of an investing MNE is to use its existing assets to generate economic rents. Strategic asset-seeking FDI can be seen as asset-augmenting in nature: the investing MNE's primary goal is to acquire additional assets which protect or augment their existing assets in some way (Narula, 2014). In general, FDI to most developing countries focuses on asset-exploiting. FDI to developed countries can also be asset-augmenting.

1.3.2. Stages

As stated earlier on, the IDP framework distinguish five different stages with different levels of outward FDI stocks, inward FDI stocks, and NOIP which is illustrated in figure 1.This section discusses which types of FDI are attracted during the different stages. An overview of this section is given in table 2.

At stage one inward FDI is likely to be limited and almost entirely resource-seeking. Since there are few other locational advantages to offer MNEs—for example, demand levels are likely to be minimal due to a low per capita income—this is often the only kind of FDI likely to occur (Dunning & Narula, 1996). Foreign firms will prefer to export to the country. A country will attract resource

seeking FDI, only when the country possess an absolute advantage in a certain resources. FDI in stage one will therefore be mainly driven by the resource richness of a country. However, at the end of stage one, a country might also start to attract some market-seeking FDI when the purchasing power of the population of the country increases (Dunning & Narula, 2000).

A country is likely to start receiving more market-seeking FDI in stage two, when domestic markets may have grown further, either in size or purchasing power. Market-seeking FDI will especially become significant either where there are substantial trade barriers to export from the home country or when adjacent markets offer significant opportunities to achieve production economies of scale (Narula & Dunning, 2000). Initially it is likely that market-seeking FDI takes the form of import substituting manufacturing investment. Market-seeking FDI requires a sizeable population and the ability of the market to support the expected demand on which the investment is based. It will therefore be mainly driven by the size of the population of the country and their purchasing power. Besides this, factors that are important to be able to successfully construct and manage industries become important in attracting FDI such as infrastructure, communication facilities, the quality of institutions, and the supply of skilled and unskilled labour (Dunning & Narula, 1996). The extent to which a country is able to provide these desirable locational characteristics will be a decisive factor in stage two for attracting market-seeking FDI. Market-seeking FDI is also likely to be stimulated by host governments which are imposing tariff and non-tariff barriers, because these increase the costs of importing products. This will make local production more preferable for MNEs.

Table 2.

Overview of the development of inward FDI motivation over the different stages

	Stage 1	**Stage 2**	**Stage 3**	**Stage 4**	**Stage 5**
Inward FDI motivation	*Resource-seeking*	*Resource-seeking* *Market-seeking*	*Resource-seeking –* *Market-seeking +* *Efficiency-seeking* *Strategic asset-seeking*	*Market-seeking –* *Efficiency-seeking +* *Strategic asset-seeking +*	*Efficiency-seeking ++* *Strategic asset-seeking ++*

Source. Based on Dunning and Narula (1996). *Note.* + and – indicate the importance of the FDI focus or FDI factors compared to the previous stage. + indicates an increasing importance and – a decreasing importance.

At stage three on the IDP, the motives of FDI will shift towards efficiency-seeking production and away from import substituting production. Comparative advantages in labour-intensive and resource-intensive industries begin to vanish due to rising wages. In industries where domestic firms have a competitive advantage, there may be some FDI directed towards strategic asset acquiring activities (Dunning & Narula, 1996). Attracting FDI will be even more dependent on the size of the

domestic and foreign market, because this allows for the capture of scale economies. This is also important for the adoption of more technology-intensive production processes, which encourages efficiency-seeking inward FDI. Furthermore, education of the labour force, efficiency of the goods market, the functioning of the labour market, the development of the financial market, and the ability to reap the benefits of existing technologies will become more important, because they play a role in attracting efficiency-seeking FDI (Narula & Pineli, 2016).

At stage four on the IDP, the motives for inward FDI will shift more and more to strategic asset acquiring activities and efficiency-seeking FDI as a result of the rising labour costs. At stage five on the IDP, FDI will be even more driven by strategic asset acquiring activities and efficiency-seeking FDI. Countries in stage five are therefore likely to be knowledge based economies. Innovation becomes therefore an important factor in explaining FDI inflows into these countries (Narula & Pineli, 2016).

1.3.3. Weaknesses IDP framework

A weak point of the IDP framework is that it uses GDP as a proxy for economic development. Narula and Dunning (2010, p.265) themselves have stated that: "GDP is itself a highly imperfect proxy for development". Countries that have a relatively high GDP per capita might have a lower economic development than countries with a lower GDP per capita. This might especially play a role in countries that are highly dependent on oil exports or other natural resources. For example, a study by Albassam (2015) found that oil is still the main engine driving the economy of Saudi Arabia, regardless of 40 years of development plans aiming to diversify the Saudi economy. It is therefore expected that the IDP framework does not hold for countries with a relatively high GDP that are highly dependent on natural resources. This also emphasized by Dunning and Narula (1996) who argued that the IDP framework should not be seen as a normative model, but more as a descriptive model. Each country follows its own idiosyncratic IDP, because country-specific factors play an important role in shaping the sectoral and industrial patterns of FDI. The IDP framework might therefore hold for countries on average but not for a particular individual country.

1.3.4. Empirical research IDP framework

Although there are several studies with the IDP as subject, there are only a couple of studies that focus on inward FDI and locational factors. Most studies focus on net outward investment (NOI) aspect of the IDP, on geographic regions, on outward FDI, or on specific countries. The studies that focus on inward FDI and locational factors are discussed in this section.

A recent empirical research by Ramírez-Alesón and Fleta-Asín (2016) focused on determining if the degree of development of the host economy moderates the influence of its locational advantages for FDI by applying it to 117 countries over a period of eight years (2006–2013). They found that at an early stage—stage one and two—the market size is more important than for more developed

economies and that natural resource richness has a surprisingly negative effect on attracting FDI. They did not find evidence that institutions and infrastructure, greater macroeconomic stability, and the increased availability of basic education and health services are more important to attracting foreign investors in stage one and two countries than in more advanced economies. With respect to stage three countries they found that a more qualified labour force, efficient labour and developed financial markets are more important factors for attracting FDI than at other stages at the IDP (Ramírez-Alesón & Fleta-Asín, 2016).

The results of Ramírez-Alesón and Fleta-Asín (2016) do not fully support the IDP framework, especially not with respect to the early stages. However, a lack of their study is that they did not make a distinction between stage one and stage two countries in their analysis. Since stage one countries are likely to receive mainly resource-seeking FDI and since stage two countries are also likely to attract market-seeking FDI, this may have led to a biased result in their research. Furthermore, they did not use control variables in their study. This is a shortcoming of their study, especially in the case of the richness in natural resources of a country. Countries that rely mainly on natural resource are more likely to be politically and economically unstable (Brunnschweiler & Bulte, 2008) which is very likely to have a negative effect on attracting FDI (Napolitano & Tissi, 2014).

Galan, González-Benito and Zuñiga-Vincente (2007) carried out an analysis on a sample of 103 firms belonging to Spain to examine the most important factors for and against the locational decisions with regard to FDI taken by MNEs based on the different IDP stages. Their results show that the importance a firm manager gives to divers locational factors depends to a certain extent on the stage a host country has on the IDP. They found that firm managers considered mainly the group of factors associated with strategic asset-seeking when deciding to locate their investment in developed countries. However, social and cultural factors play a more decisive role when firm managers decide the location of their investment in developing countries instead of the locational factors that are mentioned by the IDP framework (Galan et al., 2007).

The findings of the study by Galan et al. (2007) are thus also only partially supporting the IDP framework and again do not find support for the theory of the IDP framework with respect to countries at stage one and two. Weak points of their study are that they only used MNEs from one country in their sample and that they used qualitative information to test the framework which may be subject to respondent's judgements. In general, it can be concluded that there is no strong empirical evidence in recent literature on the IDP framework.

1.3.5. Hypotheses

To test if the shift in importance of different forms of FDI when a country economically develops as proposed by the IDP framework is in line with empirical data, the following four hypothesis have been formulated:

H1. *Locational factors that are related to resource-seeking FDI attract larger FDI stocks in stage one and stage two countries.*

H2. *Locational factors that are related to market-seeking FDI attract larger FDI stocks in stage two and stage three countries.*

H3. *Locational factors that are related to efficiency-seeking FDI attract larger FDI stocks in stage three, four, and five countries.*

H4. *Locational factors that are related to strategic asset-seeking attract larger FDI stocks in stage four and five countries.*

The method section will describe how these four hypothesis were tested. Table 3 gives an overview of the locational factors that are associated according to the IDP theory with different types of FDI which relate to the four hypotheses.

Table 3.
Overview of the locational factors associated with the different hypotheses

Hypothesis	*Locational factors*	*Stage*
1	Natural resource richness	1, 2
2	Domestic market size	2, 3
	Foreign market size	
	Market size growth	
3	Schooling labour force	3, 4, 5
	Health labour force	
	Functioning labour markets	
	Development financial markets	
	Technological readiness	
	Infrastructure	
4	Innovation	4, 5

2. Method

The following section describes the model and the data that is used to test the four hypotheses.

2.1. Model

The following model is estimated to test the four hypotheses:

$$y_{i,t} = y_{i,t-1} + \beta_0 + \beta_1 Stage_{i,t} + \beta_2 X_{i,t-1} + \beta_3 Z_{i,t-1} Stage_{i,t} + \beta_6 Cvar_{i,t-1} + \varepsilon_{i,t}$$

Where $y_{i,t}$ is the endogenous variable of FDI measured as a stock in constant 2010 United State Dollars (USD) per capita for each country, the subscript *i* correspondent to the identification number of a country ($_i$ = 1, 2, …, 107), the subscript *t* indicates the year of observation ($_t$ = 1991, 1991, ..., 2013). β_0 is an unit specific intercept term, and $Stage_{i,t}$ is a dummy variable which indicates in which stage on the IDP a country is. There are five different stage dummies, one for each stage of the IDP. The value of the dummy variable is 1 if the country is in the corresponding stage and 0 otherwise. $X_{i,t-1}$ is a dimensional vector of all one year lagged independent variables, $Z_{i,t-1}$ is the one year lagged locational variable under investigating, $Cvar_{i,t-1}$ are the one year lagged control variables used in the model, and $\varepsilon_{i,t}$ is an error term.

Stata 14 is used for the estimation of the models. An OLS panel data estimation will be executed for both models with a fixed effects model and a random effects model. The Hausman test will be used to test which model is appropriate. Besides this, robust White standard errors are used to adjust for possible heteroscedasticity problems and within-panel serial correlation in the error term $\varepsilon_{i,t}$.

The dummy variables *stage1, stage2, stage3, stage4,* and *stage5* are used to interact with the variables that represent the different locational factors to test the four hypotheses. An interaction term is calculated by multiplying the stage variables with the variable that is under investigation. This interaction term will then be included in the estimation of the model. The variable under investigation has a different effect in the corresponding stage if this interaction term yields a significant estimation. The sign of the coefficient of the estimation indicates if the effect of the variable is smaller or larger in the stage compared to the effect in other stages. The coefficient indicates how much the effect of the variable differs compared to the other stages.

2.2. Variables

This section describes the variables that have been used in this study and were the data for these variables comes from (see table 5). Data of 107 developing and developed countries is used (see appendix A). The data has an overall time span from 1991 to 2013, however, data availability for the variables differs per country and per variable. The data set is thus unbalanced.

For the dependent variable about the inward FDI stocks of a country, data from the UNCTADSTAT database of the United Nations Conference on Trade and Development (UNCTAD) is used (UNCTAD, 2015). This variable is transformed by multiplying it to the consumer price index (CPI) of the World Bank (2016) divided by 100 to transform the data to 2010 constant USD.

The one year lagged dependent variable is also included on the right hand side of the model as an independent variable. This is done, because it is likely that investments in the past attract more investments in the future. For example because a company expands or maintains its factory that they have started a year ago. As a result, the other variables are estimated on the increase or decrease of FDI stocks in a year.

The dummy variables *stage1, stage2, stage3, stage 4,* and *stage 5* are based on the GDP per capita data in constant 2010 USD from the World Bank (2016) and uses the criteria of the WEF competitive reports to divide the countries into different stages. In stage one are countries with a GDP per capita between 0 and 1999 USD; in stage two are countries with a GDP per capita between 2000 and 2999 USD; in stage three are countries with a GDP per capita between 3000 and 8999 USD; stage four are countries with a GDP per capita between 9000; and 16999 USD and stage five are countries with a GDP per capita above 17000 USD (WEF, 2015). The corresponding dummy variables have a value of 1 if the GDP per capita of the country falls in the range criteria of the dummy and a value of 0 otherwise (see table 4).

Table 4.
Overview of criteria of the stage dummies and the number of countries in each group

Interaction Dummies	**Description**	**Source**
stage1	*1 if GDP per capita between 0 and 1999 USD, 0 otherwise*	*WDI, WEF*
stage2	*1 if GDP per capita between 2000 and 2999 USD, 0 otherwise*	*WDI, WEF*
stage3	*1 if GDP per capita between 3000-8999 USD, 0 otherwise*	*WDI, WEF*
stage4	*1 if GDP per capita between 9000-16999 USD, 0 otherwise*	*WDI, WEF*
stage5	*1 if GDP per capita is above 17000 USD, 0 otherwise*	*WDI, WEF*

Note. WDI = World Development Indicators World Bank (World Bank, 2016), WEF = World Economic Forum (WEF, 2015)

To test hypothesis one with regard to resource-seeking FDI, the variables *oil* is used. This variable indicates the natural resource reserves of oil in a country. The *oil* variable is measured as natural reserves of oil in 1000 barrels per capita. The data for this variable comes from the BP statistical review of world energy 2016 (BP, 2016).

To test hypothesis two with regard to market-seeking FDI, four variables are used: *ln_gdp gdp_grwth*, *pop* an*_grwth*, and *ln_exp*. The variable *ln_gdp* is the natural logarithm of the total gross domestic product (GDP) of a country in constant 2010 USD; *gdp_grwth* is the growth of GDP per capita in percentages; *pop_grwth* the growth of the total population of a country in percentage; and *ln_exp* the natural logarithm of the value of exports of a country in constant 2010 USD. The data for all four variables comes from the WDI of the World Bank (World Bank, 2016). *ln_GDP*, *gdp_grwth* and *pop_grwth* are used to indicate the size of the domestic market of a country and if this market is growing or declining. *ln_exp* is used to indicate the size of the foreign market a country is able to access.

To test hypothesis three on efficiency-seeking FDI, the variables *total_educ, life_exp, lbr_part, dom_credit, tech_exp,* and *infra* are used. The variable *total_educ* indicates the average year of schooling the population of a country has and covers the education part of the labour force. Data for this variable comes from the Barro-Lee database (Barro & Lee, 2013). The data from the Barro-Lee database is only available in intervals of five years. Interpolation has been used to generate data for the intermediate years. The variable *life_exp* indicates the life expectancy of an inhabitant of a country at birth and covers the health part of the labour force. The data for this variable comes from the WDI of the World Bank (World Bank, 2016).

The variables *lbr_part* and *dom_credit* are used to indicate how well respectively the labour market and the financial market function in a country. The *lbr_part* variable is based on the indicator "labour force participation rate females" of the WDI of the World Bank (World Bank, 2016). The *dom_credit* variable is based on the indicator "domestic credit to private sector as a percentage of GDP" of the WDI of the World Bank (World Bank, 2016).

The *tech_exp* variable is used to indicate the technological readiness of a country and the data comes from the indicator "High technology exports in current USD" from the WDI (World Bank, 2016). This data is divided by the population of the country to adjust for the size of a country. Furthermore, the variable has been transformed using CPI to transform the variable to constant 2010 USD. The variable indicates thus the high technology exports per capita in constant 2010 USD.

The variable *infra* is used to indicate the infrastructural quality of a country. The infrastructure variable is constructed from three variables from the WDI of the World Bank (World Bank, 2016): mobile cellular subscription per 100 people, fixed telephone line subscription per 100 people and fixed broadband connections per 100 people. These three variables are selected, because they are expected to give a good representation of the infrastructure of a country over the duration of the time span from 1991 to 2013. Fixed telephone line subscriptions are likely to play a bigger role in the beginning of the time period. Later on, the mobile cellular subscription will rise in importance and at the end, broadband connections are expected to start playing a bigger role in indicating the infrastructural quality of a country. The variable infra is calculated from these variables by taking the standardized average of the three variables. All three variables have an equal weight.

To test hypothesis four on strategic asset-seeking FDI, the variable *scientific* is used. This variable represents the level of innovation of a country. The data for the variable comes from the indicator "Scientific and technical journal articles" of the WDI of the World Bank (World Bank, 2016). This variable is adjusted for the population size of a country and therefore indicates the number of scientific and technical journal articles that are published in a country per 1000 people.

Table 5.

Overview of used variables

Locational factor	**Variable name**	**Indicator/description**	**Source**
Dependent:			
FDI stock	*in_fdi_stock*	*The natural logarithm of inward stock of foreign direct investment of a country in per capita (constant 2010 USD)*	*UNCTAD*
Independent:			
H1. Resource-seeking:			
Natural resource richness	*oil*	*Natural reserves oil (thousand barrels per capita)*	*BP*
H2. Market-seeking:			
Domestic market size	*ln_gdp*	*Natural logarithm of GDP (constant 2010 USD)*	*WDI*
Foreign market size	*ln_exp*	*Natural logarithm of total values of exports (constant 2010 USD)*	*WDI*
Market size growth	*gdp_grwth*	*GDP growth (annual %)*	*WDI*
H3. Efficiency-seeking:			
Schooling labour force	*total_educ*	*Average years of total schooling (15+)*	*BL*
Health labour force	*life_exp*	*Life expectancy at birth*	*WDI*
Functioning labour market	*lbr_part*	*Labour force participation rate females*	*WDI*
Development financial markets	*dom_credit*	*Domestic credit to private sector (% of GDP)*	*WDI*
Technological readiness	*tech_exp*	*High technology exports (value in constant 2010 USD per capita)*	*WDI*
Infrastructure	*infra*	*Infrastructural quality*	*Constructed*
H4. Strategic asset-seeking:			
Innovation	*scientific*	*Scientific and technical journal articles (per 1000 people)*	*WDI*

Note. UNCTAD= United Nations Conference on Trade and Development (UNCTAD, 2015) , BP= BP statistical review of world energy 2016 (BP, 2016) , WDI=Word Development Indicators database World Bank (World Bank, 2016), BL= Barro-Lee database (Barro & Lee, 2013).

2.3. Control variables

There are also four control variables included in the model. These are the variables *pol_stab_dum ntrl_rsrc_rent*, *eco_free*, and *inequal* (see table 6).

It is likely that the political stability of a country can have a huge impact on the attractiveness of a country for foreign investors. It is therefore useful to include a variable in the model that controls for this effect. The dummy variable *pol_stab_dum* is used for this. It gives an indication of the political stability of a country. This variable is constructed from the polity IV database of the Centre of Systemic Peace (CSP, 2015). The variable "polity" in this database indicates on a scale of -10 to 10 how autocratic or democratic a country is, where -10 is strongly autocratic and 10 strongly democratic. The *pol_stab_dum* variable has a value of 1 if the score of the polity variable has increased or decreased with 3 points or more compared to the previous year. The variable has a value of 0 if the score of the polity variable is the same or if the score has increased or decreased with 2 or less points.

The variable *ntrl_rsrc_rent* is a dummy variable that has a value of 1 for countries which have a relatively high GDP per capita, but are also highly dependent on resource rents. This controls for the effect that some countries have a higher GDP per capita than which is in line with their economic development as a result of high earnings on resource exports. The criteria for this dummy variable are as follows. The dummy variable has a value of 1 if a country has a natural resource rent as percentage of GDP higher than 25% (IMF, 2010) and if the country has a GDP per capita larger than 3000 USD. It is important to note that both criteria have to be satisfied. The value of the variable is 0 if both of these criteria, or one of these criteria is not satisfied. Data for the validation of these criteria comes from the World Bank (World Bank, 2016).

The *eco_free* variable indicates the economic freedom of a country. The level of economic freedom is expected to have an influence on inward FDI stocks. Countries with a relatively high level of economic freedom are expected to attract larger FDI stocks than countries with a relatively low level of economic freedom. This variable is based on the economic freedom of the world database of the Fraser Institute (Gwartney, Lawson, & Hall, 2016).

The *inequal* variable is used to control for the effect of income inequality. High inequality has a negative influence on aggregate demand and might therefore influence the market size of a country (Stiglitz, 2009). The data for the *inequal* variable comes from the Standardized World Income Inequality Database (SWIID) database (Solt, 2016).

Table 6.
Overview of used control variables.

Control variables	**Description**	**Source**
ntrl_rsrc_rent	*GDP per capita boost as a result of natural resource rents, 1 if the natural resource rent is above 25% and if GDP is above 3000 USD*	*Constructed*
Inequal	*Inequality measured as the GINI coefficient*	*SWIID*
pol_stab_dum	*Political Stability and Absence of Violence/Terrorism: Estimate*	*CSP*
eco_free	*Economic freedom of the world*	*FI*

Note. SWIID= Standardized World Income Inequality Database (Solt, 2016), CSP= Centre of Systemic Peace (CSP, 2015), FI=Fraser Institute (Gwartney, Lawson, & Hall, 2016)

3. Results

3.1. General

First of all, a Hausman test is conducted to test if it is appropriate to use a random effect or a fixed effect model. The Hausman yields a result of $\chi^2(16)= 208.64$. $p=0.000$. This clearly rejects the null hypothesis that the difference in coefficients is not systematic. This indicates that the random effect model is not consistent and that therefore the fixed effect model should be used. So the different hypothesis are all tested using a fixed effect model.

Table 7.
Results of general model

Variable	General	
L.ln_in_fdi_stock	0.804***	(0.0282)
L.oil	0.00987	(0.0154)
L.gas	0.383	(0.497)
L.ln_gdp	0.148**	(0.0683)
L.ln_exp	-0.0151	(0.0506)
L.pop_grwth	-0.0338*	(0.0192)
L.gdp_cap_grwth	0.00193	(0.00197)
L.total_educ	0.0298	(0.0187)
L.life_expec	-0.0122**	(0.00557)
L.lbr_part	0.00215	(0.00307)
L.dom_credit	-0.00130*	(0.000727)
L.infra	0.0345	(0.0297)
L.tech_exp	-1.32	(4.23)
L.scientific	0.0982**	(0.0390)
L.ntrl_rsrc_rent	-0.0260	(0.0715)
L.inequal	0.00442	(0.00392)
L.eco_free	0.0954***	(0.0251)
L.pol_stab_dum	-0.0232	(0.0381)
_cons	-2.181	(1.697)
N	1651	
R-sq	0.880	

Note. Standard errors in parentheses, * p<.1; ** p<.05; *** p<.01

The general model shows that six of the estimated variables significantly impact the growth rate of FDI stocks (see table 4). Three estimations of these variables—the *ln_in_fdi_stock*, *ln_gdp*, and *scientific* variable—are in line with the expectations. The other three estimations of these variables—the *pop_grwth*, *life_expec*, and *dom_credit* variable—are not in line with the expectations. The detailed results of these variables will further be elucidated.

3.1.1. Variables in line with expectations

It is not surprisingly to find that—*ln_in_fdi_stock*— the one year lagged dependent variable—is highly significant with a large coefficient. If the FDI stock of last year increased with one percent, the current inward FDI stock is expected to grow with 0.804%, *ceteris paribus*.

For the variable *ln_gdp*, an increase of 1.00% of the size of a country will, *ceteris paribus*, result in an increase of 0.148% in the growth rate of inward FDI stocks. The GDP growth in the sample is on average 3.4%. As a result, the inward FDI stocks increase on average with 0.50% each year, as a result of total GDP growth. It is however important to note that the GDP also increases as a result of FDI which might results in reversed causality. It is therefore difficult to know what is the right interpretation of this result. This will be elucidated in the discussion chapter.

It is found for the *scientific* variable that the number of scientific articles that is published by a country has a positive result on the growth rate of inward FDI stocks. An increase of one article per 1000 habitants in a country is related to an increase of 9.82% in the growth rate of inward FDI stocks. The within standard deviation of scientific articles published by a country in the sample is 0.22 (see appendix C). As a result, the FDI stock increases with 2.16% if the number of scientific articles published by a country increases with one standard deviation. The effect of the number of scientific articles published in a country on the size of the FDI stocks can thus be seen as economically significant.

3.1.2. Variables not in line with expectations

It is found for the variable *pop_grwth* that an increase of 1.00% of the population size is related to a decrease of 3.38% in the growth rate of inward FDI stocks. The standard deviation of the population growth is 0.45%, so an increase of one standard deviation in population growth results in a decrease of 1.50% in the growth rate of FDI stocks. Changes in population growth have thus a significant negative effect on FDI stocks. This is surprisingly, because it was expected that population growth would have a positive effect on attracting FDI, because it increases the market size of a country. An explanation for this finding might be that the positive effect of population growth is already covered in the GDP variable and that the estimation is found to be negative as a result of outliers in the data set. There are 13 outliers (IQR>1.5 or IQR<-1.5) for the *pop_grwth* variable in the data set. However, estimation of the model without those 13 outliers still shows a negative coefficient of *pop_grwth* and it is therefore unlikely that this finding is a result of these outliers.

For the variable *life_expec* it is found that if the life expectancy in a country increases with one year, the growth rate of FDI stocks decreases with -1.22% *ceteris paribus.* The life expectancy has a within standard deviation of two), which is related to an inward FDI stock growth rate change of 2.44%. This effect can also be considered as economically significant.

The same can be said about the results of the variable *dom_credit*. These results indicate that if the domestic credit to the private sector increase with 1.00%, the growth rate of inward stocks of FDI decrease with 0.13%. The domestic credit variable has a within standard deviation of around 19.20.

This indicate that FDI stocks growth rate is affected with a 2.50% decrease when the amount of domestic credit that is provided to the private sector increases with one standard deviation.

Both results—from *life_expec* and *dom_credit*—are a surprise as it was expected that life expectancy and domestic credit would both have a positive effect on attracting FDI. An explanation for these results might be that investments in countries with well-developed financial market and high life expectancy have a lower return on investments as countries with less-developed financial market and a lower life expectancy. As a result, MNEs might be more likely to invest in countries which have less developed financial markets and a lower life expectancy.

3.2. Resource-seeking model

The interaction terms *oilstage1*, *oilstage2*, *oilstage4* are found to have a significant estimation (see table 5). The estimations of *oilstage1* and *oilstage2* show that a country has 552.70% and 450.90% larger increase of the growth rate of FDI stocks in respectively stage one and two than countries in other stages, when there is an increase of 1000 barrels of oil reserves per capita. The estimation of *oilstage4* shows that countries in stage four have a 7.52% smaller growth rate in FDI stocks when their oil reserves increase with 1000 barrels per capita compared to countries in other stages. These results are in line with hypothesis one which states that locational factors that are related to resource-seeking FDI have the largest impact in stage one countries.

Table 8.
Results of natural resource-seeking model.

Variable	Natural resources	
L.ln_in_fdi_stock	0.801***	(0.0285)
L.oil	0.0242***	(0.00826)
L.gas	0.452	(0.479)
L.ln_gdp	0.141*	(0.0727)
L.ln_exp	-0.0116	(0.0506)
L.pop_grwth	-0.0321*	(0.0193)
L.gdp_cap_grwth	0.00152	(0.00200)
L.total_educ	0.0327*	(0.0196)
L.life_expec	-0.0123**	(0.00559)
L.lbr_part	0.00247	(0.00326)
L.dom_credit	-0.00140*	(0.000726)
L.infra	0.0304	(0.0285)
L.tech_exp	-1.25	(4.29)
L.scientific	0.113***	(0.0404)
L.ntrl_rsrc_rent	-0.0226	(0.0706)
L.inequal	0.00434	(0.00403)
L.eco_free	0.0976***	(0.0246)
L.pol_stab_dum	-0.0263	(0.0375)
stage1	-0.068	(0.0942)
stage2	-0.0359	(0.0771)

stage3	0.0299	(0.0626)
stage4	0.0529	(0.0331)
stage5	(omitted)	
oil*stage1	5.53***	(1.817)
oil*stage2	4.51***	(1.522)
oil*stage3	-0.0057	(0.0590)
oil*stage4	-0.0752***	(0.0205)
oil*stage5	(omitted)	
_cons	-2.107	(1.756)
N	1651	
R-sq	0.881	

Note. Standard errors in parentheses * p<.1; ** p<.05; *** p<.01

3.3. Market-seeking model

Table 6 shows the result of the estimation of coefficients of the interaction terms between the stage variables and the variables that are related to market-seeking FDI. The results show significant coefficients estimation for the estimation of the *ln_gdp* and *ln_exp* variables and for the interaction terms of *ln_gdp* and *ln_exp* with *stage1* and *stage2*. The coefficient of the *ln_gdp* and *ln_exp* variables are 0.256 and -0.138 respectively. The coefficients of the interaction terms of *ln_gdp*—which indicates the domestic market size—are all negative. This indicates that larger countries in stage one and two attract relatively less growth rate of inward FDI stocks than larger countries in other stages. An increase of one percent in GDP will result in an increase of inward FDI stocks' growth rate which is respectively 0.248% and 0.203% less in stage one and stage two countries than in countries in other stages.

In contrast, the interaction terms of *ln_exp*—which indicates the foreign market a country can access—with the first three stages all have positive coefficients, indicating that exports have a larger positive effect on realizing FDI stocks' growth rate in stage one and two countries than in the other stages. Countries in these stages have respectively 0.282% and 0.221% larger growth rate of inward FDI stocks if their exports increase with one percent compared to countries in other stages.

The interaction terms of the *pop_grwth* variable—which indicates the growth of the population—are all not significant and population growth therefore seems to have a stable effect over the different stages.

These three findings are not in line with was expected, because the hypothesis stated that the locational factors related to market seeking FDI would have a more positive effect on the growth rate of FDI stocks in stage three compared to the other stages. Possible explanations for these surprising results might be the high correlation between the GDP variable and the export variable, the high correlation between GDP and the stage variables or reversed causality between GDP and FDI stock.

Table 9.
Results of market-seeking model.

Variable	H2. Market-seeking	
L.ln_in_fdi_stock	0.802***	(0.0272)
L.oil	0.00546	(0.0222)
L.gas	0.325	(0.490)
L.ln_gdp	0.256***	(0.0714)
L.ln_exp	-0.138***	(0.0520)
L.pop_grwth	-0.00392	(0.0123)
L.gdp_cap_grwth	0.00168	(0.00196)
L.total_educ	0.0352*	(0.0186)
L.life_expec	-0.0146***	(0.00546)
L.lbr_part	0.00112	(0.00334)
L.dom_credit	-0.00136**	(0.000684)
L.infra	0.0460*	(0.0254)
L.tech_exp	1.39	(5.83)
L.scientific	0.152***	(0.0483)
L.ntrl_rsrc_rent	0.00258	(0.0581)
L.inequal	0.00179	(0.00427)
L.eco_free	0.106***	(0.0235)
L.pol_stab_dum	-0.0295	(0.0348)
stage1	-0.504	(1.126)
stage2	-0.154	(0.926)
stage3	0.0244	(0.917)
stage4	0.634	(0.854)
stage5	(omitted)	
gdp*stage1	-0.248***	(0.0673)
gdp*stage2	-0.203***	(0.0658)
gdp*stage3	-0.0929	(0.0797)
gdp*stage4	0.0642	(0.0647)
gdp*stage5	(omitted)	
exp*stage1	0.282***	(0.0616)
exp*stage2	0.221***	(0.0600)
exp*stage3	0.0987	(0.0811)
exp*stage4	-0.0900	(0.0647)
exp*stage5	(omitted)	
pop_grwth*stage1	-0.0318	(0.0500)
pop_grwth*stage2	-0.0407	(0.0253)
pop_grwth*stage3	-0.0369	(0.0294)
pop_grwth*stage4	-0.0377	(0.0237)
pop_grwth*stage5	(omitted)	
_cons	-1.742	(1.590)
N	1651	
R-sq	0.884	

Note. Standard errors in parentheses * p<.1; ** p<.05; *** p<.01

3.4. Efficiency-seeking model

The estimation of the coefficients of the interaction terms with the locational variables related to hypothesis three about efficiency-seeking FDI—*total_educ, life_expec, lbr_part, dom_credit, infra* and *tech_exp*—yields four significant estimations (see table 7). The four interaction terms which are found to have a significant effect are *dom_credit* with *stage3* and *tech_exp* with *stage3, stage4* and *stage5*. The significant domestic credit interaction term has a coefficient of -0.0066. The estimation of the variable domestic credit is not significant. As a consequence, the results indicate that domestic credit has a negative effect of -0.0066 on the growth rate of FDI stocks in stage three countries and no effect in countries in other stages. The estimation of the variable of technological exports is found to be significant with a coefficient of -421. The significant technological exports interaction terms with stage three, four and five also have significant estimates with coefficient of 420, 389 and 422 respectively. These results show that the value of the technological exports has a negative effect on the growth rate of FDI stocks in stage one and two, but that this negative effect is negligible in stage three, stage four and stage five countries.

It can be concluded that the results are not in line with the expectations based on hypothesis three. It is possible that the estimation of interaction terms are affected by correlation between the variables. For example, the total education variable has, for example, a correlation of 0.70 with the infra variable and a correlation of 0.72 with the life expectation variable. The six variables are therefore also estimated in a reduced model in which they are estimated without the other variables of interest included but with the control variables.

In the estimation of the reduced model significant positive coefficient estimations of the variables *total_educ, life_expec, dom_credit* and *tech_exp* are shown (see table 8). The interaction terms *stage3* and *stage5* with the *total_educ* variable are found to be significant with coefficients of 0.0465 and 0.0685 respectively. The interaction term between *life_expec* and *stage2* and *stage5* have also a significant estimation, with coefficients of 0.0092 and 0.0444 respectively. The *dom_credit* variable yields two significant estimations of its interaction terms with *stage3* and *stage4*. The coefficients of these estimation are -0.0042 and -0.0029 respectively. The *tech_exp* variable shows the same results as in the full model. Most of these results are not in line with hypothesis three which stated that locational factors that are related to efficiency-seeking FDI have the largest impact in stage four and five countries.

Table 10.
Results of efficiency-seeking model.

Variable	H3. Efficiency-seeking	
L.ln_in_fdi_stock	0.815***	(0.0268)
L.oil	0.00620	(0.0116)
L.gas	0.355	(0.523)
L.ln_gdp	0.169*	(0.0982)
L.ln_exp	-0.00810	(0.0478)
L.pop_grwth	-0.0359*	(0.0201)
L.gdp_cap_grwth	0.000390	(0.00215)
L.total_educ	-0.0170	(0.0372)
L.life_expec	-0.0119	(0.00785)
L.lbr_part	0.00790	(0.00578)
L.dom_credit	0.00176	(0.00217)
L.infra	-0.0256	(0.0843)
L.tech_exp	-421***	(140)
L.scientific	0.0912	(0.0699)
L.ntrl_rsrc_rent	-0.0353	(0.0652)
L.inequal	0.00401	(0.00448)
L.eco_free	0.120***	(0.0249)
L.pol_stab_dum	-0.0410	(0.0391)
stage1	(omitted)	
stage2	1.278	(0.835)
stage3	0.396	(0.750)
stage4	-0.215	(1.390)
stage5	0.499	(1.500)
total_educ*stage1	(omitted)	
total_educ*stage2	0.0124	(0.0286)
total_educ*stage3	0.0432	(0.0327)
total_educ*stage4	-0.0256	(0.0367)
total_educ*stage5	0.0673	(0.0437)
life_expec*stage2	-0.0141	(0.0106)
life_expec*stage3	-0.00176	(0.00999)
life_expec*stage4	0.00893	(0.0161)
life_expec*stage5	-0.00859	(0.0200)
lbr_part*stage1	(omitted)	
lbr_part*stage2	-0.00533	(0.00432)
lbr_part*stage3	-0.00768	(0.00492)
lbr_part*stage4	0.000233	(0.00610)
lbr_part*steage5	-0.0117	(0.00707)
dom_credit*stage1	(omitted)	
dom_credit*stage2	-0.00335	(0.00289)
dom_credit*stage3	-0.00666**	(0.00300)
dom_credit*stage4	-0.00397	(0.00259)
dom_credit*stage5	-0.00214	(0.00222)

infra*stage1	(omitted)	
infra*stage2	0.107	(0.0914)
infra*stage3	0.0912	(0.0904)
infra*stage4	0.0197	(0.0882)
infra*stage5	0.0553	(0.0908)
tech_exp*stage1	(omitted)	
tech_exp*stage2	-440	(304)
tech_exp*stage3	420***	(140)
tech_exp*stage4	389***	(145)
tech_exp*stage5	422***	(139)
_cons	-3.082	(2.034)
N	1651	
R-sq	0.885	

Note. Standard errors in parentheses * p<.1; ** p<.05; *** p<.01

Table 11.
Results of efficiency-seeking reduced model.

	Education	Life_expec	lbr_part	dom_credit	infra	tech_exp
L.ln_in_fdi_stock	0.830***	0.824***	0.836***	0.856***	0.819***	0.842***
	(0.0302)	(0.0312)	(0.0325)	(0.0253)	(0.0341)	(0.0293)
L.total_educ	0.0151					
	(0.0197)					
L.life_expec		-0.00285				
		(0.0042)				
L.lbr_part			0.00409			
			(0.0041)			
L.dom_credit				0.000638		
				(0.0015)		
L.infra					0.0592	
					(0.0585)	
L.tech_exp						-246.1***
						(88.5)
L.ntrl_rsrc_rent	0.0651	0.0813	0.0672	0.075	0.0637	0.0795
	(0.0463)	(0.0496)	(0.0526)	(0.0593)	(0.0548)	(0.0568)
L.inequal	0.0015	0.0038	0.0051	0.0028	0.0042	0.0037
	(0.0034)	(0.0036)	(0.0036)	(0.0035)	(0.0037)	(0.0034)
L.eco_free	0.0953***	0.0985***	0.0936***	0.109***	0.0848***	0.120***
	(0.0166)	(0.0217)	(0.0217)	(0.0295)	(0.02)	(0.0286)
L.pol_stab_dum	0.00728	0.00458	0.00254	0.001401	0.0047	-0.00125
	(0.0345)	(0.0344)	(0.033)	(0.035)	(0.0351)	(0.0316)
stage1	(omitted)	(omitted)	(omitted)	(omitted)	(omitted)	(omitted)
stage2	-0.0589	-0.579**	-0.0029	0.074	0.0143	0.0383
	(0.166)	(0.238)	(0.126)	(0.071)	(0.0403)	(0.0349)
stage3	-0.244	-0.685	0.0723	0.292***	0.0832	0.108**
	(0.205)	(0.739)	(0.168)	(0.102)	(0.0516)	(0.0444)
stage4	0.432*	-1.05	0.1543	0.352***	0.211***	0.193**
	(0.227)	(0.807)	(0.270)	(0.114)	(0.0720)	(0.0753)
stage5	-0.618***	-3.101***	-0.163	0.161	0.0825	0.128
	(0.216)	(0.885)	(0.275)	(0.111)	(0.0812)	(0.0858)
interaction stage1	(omitted)	(omitted)	(omitted)	(omitted)	(omitted)	(omitted)
interaction stage2	0.0138	0.00925**	0.00998	-0.00147	0.0387	54.4
	(0.0206)	(0.00366)	(0.00257)	(0.00176)	(0.0699)	(146)
interaction stage3	0.0465*	0.0122	0.00169	-0.00420*	0.0253	241***
	(0.0260)	(0.0106)	(0.00356)	(0.00224)	(0.0617)	(88.5)
interaction stage4	-0.0192	0.0183	0.00186	-0.00286*	-0.0666	209**
	(0.0268)	(0.0118)	(0.00593)	(0.00169)	(0.0605)	(95.8)
interaction stage5	0.0685***	0.0444***	0.00721	0.000194	0.0151	271***
	(0.0237)	(0.0125)	(0.00575)	(0.00164)	(0.0586)	(88.7)
_cons	0.350*	0.493*	-0.004	0.0955	0.503**	0.136
	(0.180)	(0.278)	(0.274)	(0.174)	(0.219)	(0.150)
N	1979	2077	2077	2020	2066	1895
R-sq	0.886	0.876	0.874	0.875	0.876	0.877

Note. Standard errors in parentheses * p<.1; ** p<.05; *** p<.01

3.5. Asset-seeking model

The estimation of the interaction terms between the stage dummies and the scientific variable do not yield any significant coefficients. (see table 9). This is not in line with hypothesis four, which stated that locational factors that are related to asset-seeking FDI have the largest impact in stage five. A possible explanation might be the high correlation between the scientific variable and the *stage5* dummy variable of 0.81.

Table 12.
Results of asset-seeking model.

Variable	H4. Asset-seeking	
L.ln_in_fdi_stock	0.805***	(0.0285)
L.oil	0.00829	(0.0150)
L.gas	0.287	(0.504)
L.ln_gdp	0.157**	(0.0725)
L.ln_exp	-0.0106	(0.0505)
L.pop_grwth	-0.0345*	(0.0193)
L.gdp_cap_grwth	0.00118	(0.00198)
L.total_educ	0.0281	(0.0188)
L.life_expec	-0.0114**	(0.00563)
L.lbr_part	0.00103	(0.00320)
L.dom_credit	-0.00136*	(0.000704)
L.infra	0.0371	(0.0295)
L.tech_exp	-1.65	(4.28)
L.scientific	-2.256	(2.682)
L.ntrl_rsrc_rent	-0.0247	(0.0776)
L.inequal	0.00431	(0.00396)
L.eco_free	0.104***	(0.0267)
L.pol_stab_dum	-0.0228	(0.0386)
stage1	(omitted)	
stage2	-0.00702	(0.0477)
stage3	-0.00320	(0.0676)
stage4	0.0338	(0.0938)
stage5	-0.104	(0.114)
scientific*stage1	(omitted)	
scientific*stage2	1.860	(2.283)
scientific*stage3	2.245	(2.645)
scientific*stage4	2.178	(2.674)
scientific*stage5	2.369	(2.675)
_cons	-2.505	(1.777)
N	1651	
R-sq	0.880	

Note. Standard errors in parentheses * p<.1; ** p<.05; *** p<.01

4. Discussion

The results do not support the primary hypothesis that the impact of some locational factors on inward foreign direct investment (FDI) stocks change over the different stages of the investment development path (IDP). Only the secondary hypothesis about the locational factor related to resource-seeking FDI is supported by the results (see table 13). The other three secondary hypotheses are rejected based on the results.

Table 13.
Overview of expectations based on the hypotheses and the actual results

Hypothesis	Variables	Expectation *A more positive effect in stage:*	Result *A more:*
1. Resource-seeking FDI	Natural resource richness	1, 2	Positive effect stage 1&2
2. Market-seeking FDI	Domestic market size	2, 3	Negative effect stage 1&2
	Foreign market size		Positive effect stage 1&2
	Market size growth		No effect
3. Efficiency-seeking FDI	Schooling labour force	3, 4, 5	Positive effect stage 3&5
	Health labour force		Positive effect stage 2&5
	Functioning labour markets		No effect
	Development financial markets		Negative effect stage 3&4
	Technological readiness		Negative effect in stage 1&2
	Infrastructure		No effect
4. Asset-seeking FDI	Innovation	4, 5	No effect

4.1. Resource-seeking FDI

Hypothesis one stated that the locational factor that is related to resource-seeking FDI has a larger effect on attracting FDI stocks in stage one countries than in countries in other stages. This locational factor is the natural resource richness of a country. The results show confirmation of the hypothesis (see table 13). Resource richness—specified by the oil reserves of a country—has a larger effect on attracting larger growth rate of FDI stocks in stage one and stage two countries than in countries in other stages on the IDP.

The effect that oil has a smaller effect in stage three countries might be a result of the "Dutch Disease" effect—in which appreciation of the nation's currency as a result of resource incomes leads to less competitiveness of other sectors of the country—which might make the country less attractive for foreign investors (Van Wijnbergen, 1984).

These findings are in contrast with the findings by Ramírez-Alesón and Fleta-Asín (2016) who found a negative effect of natural resources richness on inward FDI in stage one and two. An explanation for these different findings might be that they used the weight of the primary sector—which include agriculture, forestry, hunting, and fishing—in the total GDP of the country as a proxy for natural resource richness. So they did not use a variable that takes into account natural resource richness in terms of fossil fuel reserves. Besides this, the variable they used is related to the stage interaction terms, because they are using a variable that indicates the size of the primary sector in

respect to the total GDP of a country and the stage interaction terms are based on GDP per capita. This may have resulted in different outcomes of their study and the current study.

In conclusion, the result of this study does not reject hypothesis one on natural resource-seeking FDI. The resource richness of a country does play a larger positive role in attracting inward FDI stocks in stage one countries and stage two countries than in countries in other stages on the IDP.

4.2. Market-seeking FDI

Hypothesis two on market-seeking FDI stated that locational factors that are related to market-seeking FDI attract more FDI in stage two and stage three countries. The locational factors related to market-seeking FDI are the domestic market size, the foreign market size, and the population growth of a country. Domestic market size is found to have a more negative effect in stage one and two, the foreign market size is found to have a more positive effect in stage one and two, and the effect of population growth is stable over the different stages (see table 13). Only the result on the foreign market size is partly in line with the hypothesis. However, when the negative effect of the domestic market size and the positive effect of the foreign market size is taken together—to calculate the effect of the total market size—there is a positive effect of 0.034 and 0.018 for stage one and stage two respectively.

The results are in line with the findings of Ramírez-Alesón and Fleta-Asín (2016), who also found a more positive effect of market size—which they defined as domestic and foreign market size—on attracting FDI in stage one and stage two. However, it is interesting to see that the results of the current study suggest that this effect is purely a result of the foreign market size a country can access. The domestic market size in stage one and stage two countries has a smaller effect on attracting FDI stocks than in countries in other stages.

An explanation for this effect might be that small countries are more likely to be highly depending on trade with neighbouring countries, because they cannot produce all the goods they need in their own country. As a result they depend more on trade with other countries and should be especially favourable to maintaining an open world trade regime (Alesina, 2003). They might therefore have a higher attractiveness for MNE's who want to access foreign markets in a certain region. This is also supported by Amin and Haidar (2014), who found that small countries perform better than large countries in terms of trade facilitation.

This is in contrast with the IDP theory, which states that countries in stage one and to as less extent countries in stage two are not likely to attract any other form of FDI besides resource-seeking FDI (Narula & Dunning, 2010). It seems however, that small countries in stage one and two also attract inward FDI stocks based on their exports.

In conclusion, hypothesis two is rejected by the results. A small positive effect of market size on the growth rate of inward FDI stock is found in stage one and two, but not in stage three. Moreover, this effect is only a result of the foreign market potential of a country. The results do thus not show

that locational factors related to market-seeking FDI have a larger effect in stage two and three countries than in countries in other stages on the IDP. However, small countries in stage one and two seem to attract larger FDI stock based on their export potential than countries in other stages on the IDP.

4.3. Efficiency-seeking FDI

Hypothesis three stated that factors that are related to efficiency-seeking FDI attract larger FDI stocks in stage three, four and five countries. The locational factors related to efficiency-seeking FDI are schooling of the labour force, health of the labour force, functioning of labour markets, development of financial markets, the technological readiness, and the infrastructure of a country. The result on schooling of the labour force is the only result that is in line with the hypothesis (see table 13).

This finding is in line with the finding by Ramírez-Alesón and Fleta-Asín (2016). However, they also found that the efficiency of labour markets and developed financial markets have a larger effect in stage three countries. An explanation for these different findings might be that the variables used in the current study—labour participation of women and domestic credit provided to the private sector—might not have been strong enough proxies for these two factors.

In conclusion, hypothesis three on efficiency-seeking FDI is rejected, locational factors that are related to efficiency-seeking FDI do not attract larger FDI stocks in stage three, four and five countries than in stage one and two. The only exception on this is total schooling of the labour force, which has a more positive influence on attracting FDI stocks in stage three and five countries.

4.4. Asset-seeking FDI

Hypothesis four stated that the locational factor related to strategic asset-seeking FDI attracts larger FDI stocks in stage four and five countries. This locational factor is the level of innovation in a country. The results seem to reject this hypothesis as the effect of the level of innovation is stable over the different stages (see table 13). It is possible that multicollinearity has influenced the results due to the high correlation (0.81) between the number of scientific articles published and the stage five variable. Yet, when the model is estimated with only the observations included of countries that are in stage five, the level of innovation is still not found to be significantly influencing inward FDI stocks.

The findings are in line with the findings of Ramírez-Alesón and Fleta-Asín (2016), who also did not find evidence that innovation has a different effect between stages. The results are in contradiction with the results of Galan et al. (2007), who found that firm managers considered mainly the group of factors associated with strategic asset-seeking when deciding to locate their investment in developed countries. This difference in result of Galan et al. (2007) with the current study might be explained by the fact that they have only Spanish MNEs in their sample. Firm managers of firms in other countries might consider other factors more important in their investment decision making.

In conclusion, hypothesis four on asset-seeking FDI is rejected. It is not proven that locational factors that are related to strategic asset-seeking FDI do realize larger growth rate of FDI stocks in stage four and five countries than in countries in other stages on the IDP.

4.5. General findings

In general, it is found that the inward FDI stocks of a year before, country size, population growth, life expectancy, the number of academic articles published and the domestic credit variables have an impact on the growth rate of inward FDI stocks.

When specifically looking at these variables, one year lagged inward FDI stocks and the size of the economy have a positive effect on the growth rate of the current inward FDI stock. A strong relation is found between the growth of the FDI stock of last year and the FDI stock of the current year. This result is consistent with what was expected, because it is likely that a MNE that invested last year will keep investing in the current year to keep business in the host country running. It is also found that the number of scientific articles published by a country has an economically significant positive effect on realizing the growth rate of FDI stocks.

It is found that the larger the economy of a country, the larger the growth rate of the inward FDI stock. This is in line with results from other studies (e.g. Asiedu, 2006; Walsh & Yu, 2010). However, the direction of the effect is not clear: Do larger countries have larger inward FDI stock, because a larger domestic size attracts more inward FDI or are larger countries larger as a result of inward FDI , because FDI directly increases GDP? To answer this question, a model is estimated in which the first differences of FDI stock are used as the dependent variable. The first differences of FDI stock is the growth rate of the FDI stock and is thus not a part of GDP. The coefficient estimations of the variables of interest should stay the same if there is no reversed causality. The coefficients estimations do indeed stay the same as can be seen in table 1 in appendix D. Thus an increase in GDP results in an increase in the growth rate of inward FDI stocks and not vice versa.

The variables population growth, life expectancy, and the domestic credit variables negatively impact the growth rate of inward FDI stocks. The faster a population grows, the lower the growth rate of inward FDI stocks become. This indicates that economic growth by an increase in population size does not have a positive effect on inward FDI stocks. Total GDP can only grow as result of the population size or as result of a growth in GDP per capita, so it can be concluded that an economy should grow in terms of GDP per capita to achieve larger growth rate in FDI stocks. However, this finding is not supported by the results on the growth in GDP per capita variable, which does not significantly differ from zero, even when GDP is excluded from the model. Fast growing economies do thus not attract larger inward FDI stocks than economies that grow more slowly or than economies that are even decreasing in size. It is therefore likely that the significant estimation of GDP is a result of differences in GDP and inward FDI stocks between different countries and not a result of GDP and FDI stock developments over time within a country. Yet, it is possible that the current study failed to

estimate the time effect of GDP growth on inward FDI stocks due to the limited time span of the study.

4.6. Limitations

Judson and Owen (1999) have showed that including a lagged dependent variable in a model results in biased estimates when the time dimension of the panel is small. They found that even with a time dimension as large as 30, the bias may be equal to as much as 20%. Besides this, including the lagged dependent variable on the right-hand side of the model will supress the effect of other variables in the presence of high serial correlation of the dependent variable and trending of the independent variables (Achen, 2001).

Testing the general model of the current study on serial correlation yields $F(1,102)=131.8$, $p=0.000$, which clearly rejects the null hypothesis of no serial correlation. Furthermore, it is very likely that some of the independent variables are trending, for example GDP and life expectancy. Including the lagged dependent in the model might thus not only have resulted in biased estimates, but also in suppressing the effect of other variables in the model.

The results are also likely to be biased as a result of endogeneity of some of the variables, for example GDP. A variable is endogenous when it is not only correlated with the dependent variable but also with the error term. An endogenous variable in a model will result in biased and inconsistent estimations (Verbeek, 2012). These two effects are very likely to be present in the current study and may have affected the results. It is however difficult to estimate how large this effect is.

4.7. Importance of the Results and Practical Implications

The goal of the current study was to test if the propositions theorized by the IDP framework on the relationship between inward FDI stocks, locational factors and the IDP stages are in line with empirical data. This study only found support for the resource-seeking FDI locational factors and not for the other locational factors. It is thus still questionable if the IDP framework is in line with empirical data and if it should be used to design policies to attract FDI stocks.

Besides this, the current study shows that investing in research might be a viable policy for countries to attract larger FDI stocks. Additionally, countries that are in stage three and five might be able to increase their inward FDI stocks by adopting policies to increase the total years of schooling of their habitants. Furthermore, small countries in stage one and two might be able to attract larger FDI stocks by adopting policies that focus on increasing exports from their country.

4.8. Suggestions for Future Research

Future research on this topic should focus on mitigating the endogeneity bias and the bias as a result of the inclusion of the lagged dependent variable in the model by using more complex estimating techniques such as the generalized method of moments (GMM) estimator or the

instrumental variable regression. Future research should also focus on circumventing multicollinearity problems, for example by increasing the number of observations or by taking a different approach to divide the countries in different stages. This can be done by analysing the IDP stage of each country based on their inward FDI stock, outward FDI stock and NOIP. It might also be interesting to focus on identifying how different forms of resource richness influence the effect on inward FDI stocks.

5. Conclusion

The goal of the current study was to test if the IDP framework is relevant for designing FDI policies, because the literature about the IDP framework and locational factors that attract inward FDI is limited. This was done by testing if the predictions by the IDP framework of the shift in importance of different locational FDI factors over the different stages of the IDP are in line with empirical findings. This test was executed by using a fixed effects panel data estimation on data of 107 counties to estimate the effect of interaction between locational factors and economical development.

It can be concluded that the predictions of the IDP related to resource-seeking FDI locational factors are in line with the findings of this study. However, the prediction of the IDP related to market-seeking, efficiency-seeking, and strategic asset-seeking FDI are not in line with the finding of this study. It is thus still questionable if the IDP framework is correct and in line with empirical data and if it should be used as a basis to design policies to attract FDI stocks.

Besides this, the study showed that investing in research might be a viable policy for countries to attract larger FDI stocks. Additionally, countries that are in stage three and five might be able to increase the growth rate of their inward FDI stocks by adopting policies to increase the total years of schooling of their habitants. Furthermore, small countries in stage one and two might be able to attract larger FDI stocks by adopting policies that focus on increasing exports from their country.

Future research on this topic should focus on mitigating the endogeneity bias and the bias as a result of the inclusion of the lagged dependent variable in the model by using more complex estimating techniques such as the generalized method of moments (GMM) estimator or the instrumental variable regression. Future research should also focus on circumventing multicollinearity problems, for example by increasing the number of observations or by taking a different approach to divide the countries in different stages. This can be done by analysing the IDP stage of each country based on their inward FDI stock, outward FDI stock and NOIP. It might also be interesting to focus on identifying how different forms of resource richness influence the growth of inward FDI stocks.

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Appendix A.: List of countries

Table 1.

List of the 107 countries used in the study with the number of observation per country.

Economy	Freq.	Percent	Cum.
Albania	12	0.73	0.73
Algeria	1	0.06	0.79
Armenia	8	0.48	1.27
Australia	22	1.33	2.6
Austria	9	0.54	3.15
Bangladesh	19	1.15	4.3
Belgium	9	0.54	4.84
Benin	4	0.24	5.08
Bolivia	22	1.33	6.42
Botswana	6	0.36	6.78
Brazil	23	1.39	8.17
Bulgaria	17	1.03	9.2
Burundi	12	0.73	9.93
Cameroon	10	0.61	10.53
Canada	18	1.09	11.62
Central African Republic	2	0.12	11.74
Chile	5	0.3	12.05
China	4	0.24	12.29
Colombia	9	0.54	12.83
Costa Rica	20	1.21	14.04
Cote d'Ivoire	4	0.24	14.29
Croatia	17	1.03	15.31
Cyprus	17	1.03	16.34
Czech republic	19	1.15	17.49
Denmark	23	1.39	18.89
Dominican republic	13	0.79	19.67
Ecuador	23	1.39	21.07
Egypt	19	1.15	22.22
El Salvador	20	1.21	23.43
Estonia	18	1.09	24.52
Fiji	14	0.85	25.36
Finland	21	1.27	26.63
France	20	1.21	27.85
Gabon	1	0.06	27.91
Germany	21	1.27	29.18
Ghana	18	1.09	30.27
Greece	22	1.33	31.6
Guatemala	20	1.21	32.81
Guyana	10	0.61	33.41
Honduras	19	1.15	34.56
Hungary	22	1.33	35.9
India	21	1.27	37.17
Indonesia	23	1.39	38.56
Iran	4	0.24	38.8
Ireland	9	0.54	39.35
Israel	23	1.39	40.74
Italy	21	1.27	42.01
Jamaica	14	0.85	42.86
Japan	16	0.97	43.83
Jordan	19	1.15	44.98
Kazakhstan	8	0.48	45.46
Kenya	16	0.97	46.43
Korea	23	1.39	47.82
Kyrgyz republic	1	0.06	47.88
Latvia	17	1.03	48.91
Lithuania	17	1.03	49.94
Luxembourg	12	0.73	50.67
Malawi	18	1.09	51.76
Malaysia	22	1.33	53.09
Mali	14	0.85	53.93
Mauritius	16	0.97	54.9
Mexico	23	1.39	56.3
Moldova	8	0.48	56.78
Mongolia	4	0.24	57.02
Morocco	15	0.91	57.93
Mozambique	4	0.24	58.17
Namibia	9	0.54	58.72
Nepal	6	0.36	59.08
Netherlands	20	1.21	60.29
Nicaragua	11	0.67	60.96
Niger	14	0.85	61.8
Norway	16	0.97	62.77
Pakistan	20	1.21	63.98
Panama	19	1.15	65.13
Papua New Guinea	6	0.36	65.5
Paraguay	23	1.39	66.89
Peru	22	1.33	68.22
Philippines	22	1.33	69.55
Poland	22	1.33	70.88
Portugal	21	1.27	72.15
Romania	18	1.09	73.24

Russian Federation	18	1.09	74.33
Rwanda	9	0.54	74.88
Senegal	16	0.97	75.85
Serbia	6	0.36	76.21
Singapore	23	1.39	77.6
Slovak	19	1.15	78.75
Slovenia	18	1.09	79.84
South Africa	21	1.27	81.11
Spain	21	1.27	82.38
Sri Lanka	19	1.15	83.54
Sweden	23	1.39	84.93
Switzerland	22	1.33	86.26
Tanzania	15	0.91	87.17
Thailand	21	1.27	88.44
Togo	6	0.36	88.8
Trinidad and Tobago	15	0.91	89.71
Tunisia	20	1.21	90.92
Turkey	23	1.39	92.31
Uganda	18	1.09	93.4
Ukraine	15	0.91	94.31
United Kingdom	23	1.39	95.7
United States	23	1.39	97.09
Uruguay	21	1.27	98.37
Venezuela	5	0.3	98.67
Vietnam	8	0.48	99.15
Zambia	14	0.85	100
Total	1,652	100	

Appendix B.: Correlation Matrix

Table 1.

Correlation matrix

	ln_in_FDI_stock	Gdp_cap	oil	gas	ln_gdp	ln_exp	pop_growth	gdp_cap_grwth	Total_educ	life_expec	lbr_part	dom_credit	infra	tech_exp	scientific
ln_in_fdi_stock	1.00														
gdppercapita	0.71	1.00													
oil	0.10	0.18	1.00												
gas	0.16	0.22	0.44	1.00											
ln_gdp	0.46	0.55	0.16	0.12	1.00										
ln_exp	0.62	0.56	0.14	0.13	0.93	1.00									
pop_grwth	-0.41	-0.25	-0.02	-0.09	-0.30	-0.31	1.00								
gdp_cap_growth	-0.07	-0.16	-0.02	0.06	-0.07	-0.06	-0.13	1.00							
total_educ	0.73	0.58	0.12	0.18	0.49	0.54	-0.62	0.03	1.00						
life_expec	0.72	0.62	0.10	0.08	0.57	0.61	-0.53	-0.04	0.72	1.00					
lbr_part	0.13	0.33	0.08	0.05	0.06	0.04	-0.15	-0.03	0.23	-0.04	1.00				
dom_credit	0.57	0.63	0.06	0.03	0.55	0.56	-0.20	-0.18	0.51	0.55	0.16	1.00			
infra	0.72	0.71	0.08	0.04	0.50	0.55	-0.41	-0.12	0.70	0.67	0.30	0.62	1.00		
tech_exp	0.33	0.22	-0.02	-0.02	0.13	0.28	0.05	-0.01	0.10	0.15	0.05	0.16	0.18	1.00	
scientific	0.68	0.82	0.08	0.07	0.51	0.54	-0.28	-0.17	0.63	0.61	0.36	0.63	0.84	0.26	1.00
ntrl_rsrc_rent	0.04	-0.04	0.31	0.41	0.04	0.05	-0.05	0.13	0.09	-0.04	0.03	-0.08	0.00	-0.03	-0.07
inequal	-0.36	-0.57	-0.09	-0.10	-0.30	-0.31	0.46	0.03	-0.52	-0.47	-0.28	-0.29	-0.50	-0.03	-0.57
eco_free	0.65	0.60	-0.01	0.05	0.37	0.38	-0.24	0.03	0.57	0.60	0.18	0.60	0.58	0.19	0.57
pol_stab_dum	-0.14	-0.11	0.02	0.01	-0.07	-0.08	0.05	-0.07	-0.13	-0.13	0.00	-0.10	-0.13	-0.03	-0.11
stage1	-0.68	-0.41	-0.10	-0.13	-0.43	-0.49	0.51	-0.02	-0.64	-0.71	0.06	-0.42	-0.48	-0.11	-0.38
stage2	-0.17	-0.22	-0.06	-0.07	-0.17	-0.17	0.08	0.04	-0.17	-0.05	-0.29	-0.14	-0.20	-0.06	-0.21
stage3	0.03	-0.31	-0.03	0.04	-0.11	-0.04	-0.11	0.09	0.01	0.00	-0.20	-0.12	-0.22	-0.05	-0.33
stage4	0.15	-0.07	0.10	0.07	0.06	0.07	-0.29	0.16	0.26	0.12	0.03	-0.08	0.18	-0.04	-0.01
stage5	0.61	0.86	0.09	0.07	0.56	0.55	-0.21	-0.20	0.52	0.61	0.30	0.65	0.65	0.22	0.81

Correlation matrix continued

	ntrl_rent	inequal	eco_free	pol_stab_dum	stage1	stage2	stage3	stage4	stage5
ntrl_rsrc_rent	1.00								
inequal	-0.02	1.00							
eco_free	-0.07	-0.23	1.00						
pol_stab_dum	0.00	0.06	-0.17	1.00					
stage1	-0.07	0.24	-0.46	0.11	1.00				
stage2	-0.04	0.17	-0.11	0.05	-0.17	1.00			
stage3	0.06	0.34	-0.09	0.00	-0.33	-0.19	1.00		
stage4	0.18	-0.14	0.02	-0.03	-0.19	-0.11	-0.21	1.00	
stage5	-0.09	-0.56	0.57	-0.11	-0.36	-0.21	-0.39	-0.23	1.00

Appendix C.: Descriptive Statistics

Table 1.

Summary of the mean, standard deviations, minimum, maximum and number of observations for each variable

Variable		Mean	Std. Dev.	Min	Max	Observations
Id	overall	111.2312	59.46146	5	217	N = 1652
	between		60.67424	5	217	n = 107
	within		0	111.2312	111.2312	T = 15.4393
Year	overall	2002.731	6.061023	1991	2013	N = 1652
	between		2.997225	1993.5	2011.5	n = 107
	within		5.633589	1990.573	2013.958	T = 15.4393
ln_in_FDI_stock	overall	7.296178	1.95709	-1.95477	15.48888	N = 1652
	between		1.963274	1.947205	12.39752	n = 107
	within		0.679776	2.850684	14.70942	T = 15.4393
Oil	overall	0.139554	0.718132	0	10.22567	N = 1652
	between		0.973438	0	8.766761	n = 107
	within		0.238935	-2.49836	2.262119	T = 15.4393
ln_gdp	overall	25.29448	1.977905	20.98606	30.38936	N = 1652
	between		2.056022	21.00998	30.16914	n = 107
	within		0.217624	24.59069	25.98974	T = 15.4393
ln_exp	overall	24.25333	1.995547	18.26155	34.23011	N = 1652
	between		2.06353	19.09278	28.27311	n = 107
	within		0.496409	22.58847	31.8751	T = 15.4393
pop_growth	overall	1.156392	1.162718	-3.82017	7.988684	N = 1652
	between		1.108378	-1.14314	4.056067	n = 107
	within		0.445828	-2.80528	5.089009	T = 15.4393
gdp_cap_grwth	overall	2.444661	3.549033	-14.5599	15.57375	N = 1652
	between		1.946795	-2.77485	8.359978	n = 107
	within		3.141906	-17.2664	15.94446	T = 15.4393
total_educ	overall	8.367501	2.757363	1.054	14.502	N = 1652
	between		2.825377	1.455857	12.79626	n = 107
	within		0.664616	6.145588	11.87268	T = 15.4393
life_expec	overall	70.70173	8.88565	35.66	83.08	N = 1652
	between		9.525883	47.22	81.70312	n = 107
	within		2.01201	59.14173	81.69061	T = 15.4393

lbr_part	overall	57.35878	15.20875	10.1	90.5	N = 1652
	between		15.87252	13.22105	89.76	n = 107
	within		3.047844	43.26787	70.39211	T = 15.4393
dom_credit	overall	58.13745	46.54864	0.19	253.56	N = 1652
	between		41.96842	4.18	195.8244	n = 107
	within		19.21855	-27.0639	144.8561	T = 15.4393
Infra	overall	0.599467	1.095855	-0.53	3.98	N = 1652
	between		0.875242	-0.53	2.796667	n = 107
	within		0.696621	-1.13532	2.505182	T = 15.4393
tech_exp	overall	821.7559	3971.23	2.01E-05	124026.3	N = 1652
	between		2145.2	0.004065	19952.92	n = 107
	within		3080.306	-11702.2	118831.2	T = 15.4393
scientific	overall	0.369919	0.523009	0	2.603474	N = 1652
	between		0.447046	0.000617	1.721669	n = 107
	within		0.227691	-0.56242	1.277731	T = 15.4393
ntrl_rsrc_rent	overall	0.01816	0.13357	0	1	N = 1652
	between		0.184791	0	1	n = 107
	within		0.081649	-0.58184	0.974682	T = 15.4393
inequal	overall	37.42957	8.65162	20.3799	65.503	N = 1652
	between		8.376705	23.2738	62.39858	n = 107
	within		1.986483	27.58853	51.0226	T = 15.4393
eco_free	overall	6.796281	0.894773	3.336	8.88	N = 1652
	between		0.830966	4.106	8.69913	n = 107
	within		0.443498	4.493726	8.075725	T = 15.4393
pol_stab_dum	overall	0.02845	0.166306	0	1	N = 1652
	between		0.119412	0	1	n = 107
	within		0.15369	-0.47155	0.984972	T = 15.4393
stage1	overall	0.229419	0.420586	0	1	N = 1652
	between		0.433541	0	1	n = 107
	within		0.140072	-0.63422	1.098984	T = 15.4393
stage2	overall	0.092615	0.28998	0	1	N = 1652
	between		0.214978	0	1	n = 107
	within		0.192202	-0.68999	0.997377	T = 15.4393
stage3	overall	0.265133	0.441538	0	1	N = 1652

	between		0.390277	0	1	n = 107
	within		0.234622	-0.63963	1.212502	T = 15.4393
stage4	overall	0.112591	0.316188	0	1	N = 1652
	between		0.258372	0	1	n = 107
	within		0.207907	-0.67688	1.007328	T = 15.4393
stage5	overall	0.300242	0.458502	0	1	N = 1652
	between		0.422362	0	1	n = 107
	within		0.100145	-0.58865	1.189131	T = 15.4393

Appendix D.: Model with dependent variable with first differences

Table 1.

Model with first differences of FDI as dependent variable

	First differences FDI, general model	
L.ln_in_fdi_stock	-0.196***	(0.0282)
L.oil	0.00987	(0.0154)
L.gas	0.383	(0.497)
L.ln_gdp	0.148**	(0.0683)
L.ln_exp	-0.0151	(0.0506)
L.pop_grwth	-0.0338*	(0.0192)
L.gdp_cap_growth	0.00193	(0.00197)
L.total_educ	0.0298	(0.0187)
L.life_expec	-0.0122**	(0.00557)
L.lbr_part	0.00215	(0.00307)
L.dom_credit	-0.00130*	(0.000727)
L.infra	0.0345	(0.0297)
L.tech_exp	-0.00000132	(0.00000423)
L.scientific	0.0982**	(0.0390)
L.ntrl_rsrc_rent	-0.0260	(0.0715)
L.inequal	0.00442	(0.00392)
L.eco_free	0.0954***	(0.0251)
L.pol_stab_dum	-0.0232	(0.0381)
_cons	-2.181	(1.697)
N	1651	
R-sq	0.239	

Note. Standard errors in parentheses * p<.1; ** p<.05; *** p<.01