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The Effects of Trade Facilitation on Horizontal and
Vertical Foreign Direct Investments.

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Abstract

Along with a deeper integrated world economy have countries discovered the benefits of harmonizing and simplifying the procedures linked to international trade, referred to as trade facilitation. A quite unexplored part of this field of research is yet how trade facilitation affects international investment flows, referred to as Foreign Direct Investments (FDI). In theory is trade facilitation affecting FDI differently as a result of the incentives for the FDI. If trade is facilitated on a market where the subject to the investment is aimed for further export will less costly and time-consuming trade procedures increase the inflows of investments to that country. If trade is on the other hand facilitated in a country where no further export is intended can the investments levels actually decrease. The aim of this thesis is to empirically demonstrate the ambiguous link between trade facilitation and FDI with the purpose of helping policy makers strategize their trade facilitating actions. In order to show this link are the FDI hosting countries being divided into groups depending on market size and level of development. The survey is conducted by using a gravity model where the sample ranges from 2005 to 2012 and is being estimated by a Poisson Pseudo Maximum Likelihood regression. The results show how facilitated trade in a host country causes greater inflows of FDI than before. These positive effects are however greater if the receiving market is small which indicates that countries with the intention to export a foreign-funded product will benefit more from trade facilitation than larger markets where the product is being domestically consumed. Further results show that trade facilitation is more beneficial for large developed countries than small underdeveloped countries.

Keywords: Trade Facilitation; Horizontal FDI; Vertical FDI

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1. Introduction

Research on firms' incentives to invest abroad has been going on for a couple of decades and scholars have found some determinants that seem to affect Foreign Direct Investments (FDI). Simultaneously has the world become more globalised and a new variable, referred to as trade facilitation, is now taken into consideration when discussing Foreign Direct Investments. Trade facilitation can be described as the harmonization and simplification of international trade. When import and export procedures become more efficient, this has been shown to have a positive effect on bilateral trade flows. What the literature has been lacking is to empirically show the effects of trade facilitation on Foreign Direct Investments. Hence, my aim in this thesis is to find the effect trade facilitation has on Foreign Direct Investments by developing a gravity model that takes the motive of the investment into consideration. Theory holds that small, low-skilled labour abundant economies are often used as export platforms which makes them sensitive to trade costs caused by inefficient border procedures. Large economies, on the other hand, are attracting market-seeking investors who would consequently be less sensitive to such trade procedures. This leads up to the hypotheses that trade facilitation should show a stronger positive effect on investments made in small markets than in major markets.

My sample consist of developed source countries investing in a wide range of countries all over the world. I choose a gravity model to observe the bilateral investments where the proxy for trade facilitation is the number of days it takes to export from the host country. The sample is divided into groups consisting of large versus small markets in order to find the effect from trade facilitation on large and small markets separately. Further, am I also dividing the hosting countries by their state of development since it can theoretically have an effect on the FDI incentives. The results from this model show, according to the hypotheses, that FDI made on smaller markets increase when trade is facilitated. Less time-consuming trade procedures are also affecting the investments on larger markets in a positive direction, but not as sharply as in smaller markets.

These findings are useful in the policy discussion since they show how trade facilitating actions can actually increase the FDI inflows to a country. As these positive effects are particularly strong for small economies should such actions be taken into serious consideration by decision-makers, since these countries often have a high growth potential. Trade procedures are in

addition costly in their design as they demand administration at the border and technical adaptations behind the border, which should make the incentives for trade facilitation even stronger.

The remainder of the paper is organized as follows. In chapter 2 will the term trade facilitation be thoroughly explained and what effects it can have on the world economy. In chapter 3 is the theoretical link between trade facilitation and FDI clarified and the terms vertical and horizontal FDI will be described. A summary of the previous research on the field will be presented in chapter 4, which is followed by the empirical method in chapter 5. The results will be explained in chapter 6 along with some robustness checks. The results are being summarized in chapter 7 where I draw some conclusions on what impact this research can have on the policy debate.

2. Trade Facilitation

Along with a more integrated and globalised world have trade costs turned into a hot topic on the political scene as nations create complex transnational networks to reduce these costs as much as possible. The most apparent costs being successively eliminated are tariffs, but when changes in administrative procedures at the border or technical barriers behind the border streamlines trade is trade facilitation taking place.

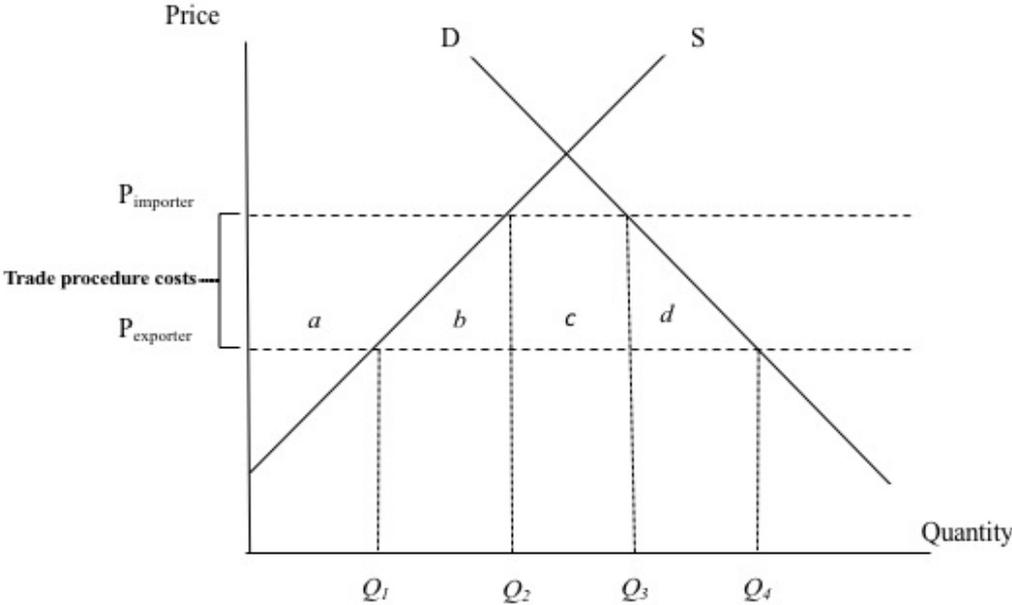
2.1 Definition

Trade facilitation is defined by the World Trade Organisation (WTO) as ‘The simplification and harmonisation of international trade procedures,’ with trade procedures being ‘the activities, practices and formalities involved in collecting, presenting, communicating and processing data required for the movement of goods in international trade’ (WTO, 2013). Furthermore, are actors in different Regional Trade Agreements interpreting this definition in altered ways. Some focus on improving administrative procedures at the border, known as reducing the red tape. These actions could be aims for reducing bureaucratic strategies or streamlining the management, skill level among employees or their technical gear. Other operators with the desire to facilitate trade strive to change behind-the-border measures, such as quality of infrastructure and regulatory environment, which are in contrast to many border barriers non-discriminating economic activities (WTO, 2015; Wilson et. al., 2004).

2.2 The Welfare Costs from Trade Procedures

When trade is taking excessive amounts of time, this delay result in costs for the trading partners and causes a wedge between the price received by the exporter and the price paid by the importer. The domestic price in the importing country will rise above the world price and decrease domestic demand. If this extra costs from trade procedures would instead be caused by a tariff imposed on the importer it would turn into social benefit for the government in the importing country along with some shared welfare loss, referred to as dead-weight loss, due to the decrease in demand. When non-tariff trade procedures are causing this decrease in demand however, none of the trading partners are better off and these transport costs will be defined as pure loss (WTO, 2015). These effects are demonstrated below in *Figure 1*.

Figure 1.



Source: Author's illustration

The price level in the importing country is higher than the prices in the exporting country due to extra costs from trade procedures. These higher prices are consequently leading to a smaller demand and hence is the importing country only importing Q_3-Q_2 . However, if the trade would be facilitated to the degree that all additional costs from trade procedures goes away, the price would, in this equilibrium, go down to the same level as in the exporting country. Hence, the quantity of imported goods would increase from Q_3-Q_2 to Q_4-Q_1 . If there would instead have been a tariff of the same cost that had been removed, the same reaction would occur.

The crucial difference between taking away a tariff compared to trade procedures lies in the governmental revenue. In both the tariff release case and the trade facilitation case is the area $a+b+c+d$ responding to the increased consumer surplus in the importing country due to the lower price the importer pays. The domestic producers on the other hand are being worse off due to lower prices and hence producer surplus is decreasing by area a . When the tariff was apparent it made up for a governmental profit for the importing country, consisting of area c , which is now also lost. The net welfare would hence consist of $b+d$ in the importing country when a tariff is being removed. In the trade facilitated case however, will the government not

lose out on any governmental income and the net welfare for the importing country will make up for $b+c+d$ and is therefore a larger welfare effect than a tariff reduction of the same size.

The costs resulting from trade procedures are both directly related to the administration and supply of information at the border but also indirectly related to the value of the traded good, since inefficient border procedures causes procedural delays, lost business opportunities and lack of predictability in the regulations and also likely diminish the competitiveness of exporting firms (OECD, 2005). Sensitive agents of these delays are mainly large manufacturers which preferably use just-in-time production over warehousing and are hence heavily dependent on timely and frequent deliveries of intermediate goods and raw material for their production. Agricultural goods and other time-sensitive or fashion-oriented products have a high depreciation rate from transport time and hence, inefficient trade procedures make them lose comparative advantage (Engman, 2005). These costly trade procedures might also affect the propensity to invest for a foreign investor since it can decrease the return on the investment.

However, even if the benefits seem evident, trade facilitation has not yet reached as far as it is capable of doing. The reason is that improving an inefficient customs system is costly and time enduring. It is in addition hard to measure trade facilitation and when translating it into actual costs it is often being interpreted as a side effect of a wider reform such as a trade agreement or a transition to a market economy (OECD, 2005).

2.3 Measurements

There are various ways to measure trade facilitation since there are many different effects that can be observed by using different indicators. These indicators are also frequently updated due to the new challenges and issues associated with a changing and globalising world (Brown, 2009). The World Bank group has produced some of the most established indicators on trading across borders which are called the “Doing Business” indicators. These indicators want to capture how especially small and medium-sized businesses are affected by business regulations and the protection of property rights. They create these studies by using local experts in 189 economies who can find information on how long it takes to start a business, trade across borders, enforce contracts or getting credit, etc. These observations are then ordered in two different indexes: “Distance to Frontier” and “Ease of Doing business”, where the first explains how far the observed country is from the best performing economy and the latter is a ranking of countries reflecting their relative performance (World Bank Group, 2016). Other

organisations that collect indicators of trade facilitation are the World Bank's Logistics Performance Index (LPI), the Organisation for Economic Co-operation and Development's (OECD) Trade Facilitation Indicators (TFIs) and the World Economic Forum's Enabling Trade Index (ETI) (WTO, 2015).

In this thesis I use the indicator for *days to export* from *Trading across Borders* as my variable of interest which shows how many days it takes for a standardized good to go through all necessary procedures in order to be exported. This indicator has been used in several other studies such as (Olofsdotter and Persson, 2013), (Djankov, et. al., 2006) and (Portugal-Perez and Wilson, 2015) among others. In 2005, which is the start of the sample, was the world mean for days to export 27.83 and in 2013 22.1 days, which is a proof of a reduction in the average days to export on a global perspective. The countries taking the shortest time to export their goods were the same in both 2005 and 2013, i.e. Estonia, the United States, Singapore and Hong Kong, taking only 6 days on average. The countries taking the longest time was Iraq accounting for 102 days in 2005 and Afghanistan accounting for 81 days in 2013. Due to the large variation in the time to export between countries is this a fairly good estimate for trade facilitation. Another advantage of the *days to export* measure is it's bluntness since it is not an index as many other measurement types. The negative elements of the *days to export* measure however, is that it fails to differentiate between products and firm size since these traits can affect the exporting time.

A clear cross-sectional difference between countries can be observed when using this measure. On the other hand is the difference over time not very significant since data has only been collected since 2003 and trade facilitating procedures being quite sticky. It is therefore important to take the cross-sectional variation in to consideration when estimating this kind of data. Further description of the data will follow in chapter 5.

3. The link between Trade Facilitation and Foreign Direct Investments

Theoretically there is a link between the degree of trade facilitation and the level of Foreign Direct Investments (FDI). This theory is in FDI literature mainly based on *the Knowledge Capital Model*, developed by Markusen et al. (1996) and later applied on the multinational enterprise by Carr et al. (2001). This model draws three basic assumptions: *Fragmentation*, *Skilled-Labour Intensity* and *Jointness*.

Fragmentation means that Research and Development (R&D) does not necessarily need to take place at the same geographical space as production and can therefore be transferred to the production site for a low cost leading to production in cost effective locations. The R&D activities are on the other hand *skilled-labour intensive* in relation to production and will therefore often take place in the source country. The insights from R&D can nevertheless be applied to multiple production sites which makes up for the *jointness* in the model and can almost be considered as public knowledge.

Trade costs may be a determining factor in whether a source country should fragmentise its investments. Hence, is the relationship between trade costs and FDI ambiguous since higher trade costs makes it beneficial for firms to make use of the jointness of R&D and produce at the market where they want to sell the product. Lower trade costs can on the other hand favour fragmented investments abroad if the good that is aimed for export can be produced at a lower cost (Neary, 2008). These different types of FDI are referred to as horizontal and vertical FDI and will be more thoroughly explained below.

3.1 Vertical FDI

The theory of vertical FDI stems from Helpman (1984), who developed a general-equilibrium model in a two-country framework where the multinational firm is a result from the desire to make use of cheaper input factors abroad and consequently is the production process fragmented into different stages. More recent research relaxes this two-country assumption and refers to foreign investments being “complex-vertical”, where the strategy is to have production activities distributed among multiple countries. This is because many input factors can be produced more efficiently by capturing the networks and comparative advantages of several regions.

A host country can also be used as an export-platform when it has comparative advantage in producing a specific good and beneficial access to serve a third market with these exports. Hence, the size of the third markets which is often neighbouring regions, is also of importance and will be discussed further in the section on horizontal FDI (Blonigen, et. al., 2005).

This multinational framework can be linked to trade facilitation. Since it is important for the intermediate and final good to be efficiently transferred between the different sources of production may lower trade costs increase the FDI-flows, meaning that vertical FDI is a complement to trade. Furthermore, when the receiver of the FDI resides in regions with good trade connections to other producers in the manufacturing line agglomerations forces might arise which increases the FDIs to the region (Blonigen, et al., 2005).

Showing these effects empirically is problematic since all FDI-data is lumped together. However, vertical FDI is, as the Knowledge Capital model suggest, transferred from skill-intensive countries to countries with comparative advantage for exporting a specific good where the comparative advantage is, not seldom, low-skilled labour. Furthermore, should the market size of the host country not affect the degree of vertical investments but if the host country works as an export-platform does the surrounding, “third-markets” sizes matter (Walckirch, 2002).

3.2 Horizontal FDI and the Home Market Effect

Along with Helpman’s theory on vertical FDI, did Markusen release a contrasting paper in 1984, where he presented a general equilibrium in a two-country world where multinational enterprises arise due to market seeking objectives functioning as a substitute to exportation. This phenomena was termed horizontal Foreign Direct Investments. Markusen’s theory has been further developed into a framework with multiple countries where horizontal FDI is now considered as a strategy to get market access by avoiding trade frictions, such as transport costs or other trade procedures. Increased trade facilitation will thus decrease the level of horizontal FDI invested in a country since the gains from domestic production and imports will then become smaller (Blonigen et. al., 2005).

In order for the horizontal investment costs to be as low as possible is it positive for the host country to be similar in size and have relatively similar endowments as the source country. If countries are different with respect to their endowments, for instance if one country has skilled

labour and the other unskilled labour, will the skilled-labour abundant country turn into a headquarter site while the unskilled country will be the production site leading to better returns from a vertical FDI. A multinational firm will profit from a horizontal FDI if the receiving country can host the whole labour force needed, from highly educated administration staff to low-skilled manufacturers, since there will be a full production site in the country. If the countries would be different in size and the source country is larger than the host country, then the source country could dominate the production on its own and a smaller production site would just be an additional cost (Waldkirch, 2002).

When the hosting market is large enough to cover the high costs of setting up a plant does the Home Market Effect occur - first demonstrated by Krugman (1980). If a country has a large number of consumers within a market, it will benefit from economies of scale and consequently gain a trade surplus. This country will therefore be more attractive to foreign investors and then the Home Market Effect occurs. This is a result of large countries or regions having the capacity to offer a high diversity of products without being exposed to time-consuming trade procedures. Hence, will the products' prices be lower in these markets and the attractiveness of the location for producers will also drive up the wages in the area. Consequently, is the Home Market Effect attracting horizontal FDI to large countries, especially if trade costs are high. The economies of scale in these large markets can however make them work as export-platforms as well since foreign investors may be attracted by the markets of the neighbouring countries, especially if the trade costs are low within the region (Davis and Weinstein, 1999). Trade facilitation on a market where a home market effect is present could therefore result in an ambiguous effect on horizontal FDI.

3.3 Hypotheses

My aim with this thesis is to find the effects of trade facilitation on Foreign Direct Investments. According to theory will trade facilitation have an ambiguous effect on FDI depending on whether the investment is vertical or horizontal. My hypothesis is that there is a positive relation between trade facilitation and vertical FDI. Furthermore, will the effect from trade facilitation on horizontal FDI be either positive or negative but overall more negative than in the case of vertical FDI. As described above will market size and level of skilled labour also be of great importance for whether an investment is horizontal or vertical but this will be discussed more thoroughly in the empirical part of the thesis.

4. Previous Research

One of the earliest researchers on the link between trade facilitation and Foreign Direct Investments was Engman (2005) who claimed that efficient border procedures are of particular importance when attracting FDI to industries producing time-sensitive or perishable goods. Unfortunately, did not Engman perform any econometrical estimations on this link.

There is however some work in progress on this link. Portugal-Perez and Wilson (2015) show that countries with low income per capita tend to have a higher degree of inefficient trade procedures, subsequently resulting in less FDI inflows to these countries. The authors are not explicitly separating the investments in vertical and horizontal FDI but they find that the negative correlation between trade procedures and FDI is stronger for developing countries that are landlocked than for coastal developing countries. They also find that the larger GDP a country possesses, the more FDI it is attracting and that the source countries tend to be members of the OECD. However, this report is still in progress why the results should be handled with some discretion. These findings are indicating that the size of a country's GDP and its degree of development and income level is of importance for a study on trade facilitation affecting FDI.

Olofsdotter and Persson (2013), have drafted a report where they want to examine how trade facilitation affects Foreign Direct Investments. Their hypothesis is that the effect of trade procedures on vertical FDI should be negative while the effect on horizontal FDI could be either positive or negative. They emphasize however that the effect from trade should be less negative than the effect on vertical FDI. They have found preliminary but promising results that time-consuming export procedures are negative for both large and small markets but that the small markets experience a stronger negative effect, which is in line with theory. It is the research from Olofsdotter and Persson I will mainly use for my contribution to the field.

In the field of FDI research has some important determinants been found in order to understand the incentives for horizontal and vertical FDI respectively. Blonigen and Wang (2004) used a level of development approach in their studies on FDI as they separated the host countries in groups of developed or developing receivers of FDI. They hypothesised that developed countries are investing vertical FDI in developing countries and that horizontal FDI is mainly apparent between countries of similar size. They are also capturing the effects from relative factor endowments, such as skill and cost of labour, in their model. They find that the observed

FDI patterns are dominated by horizontal investments. This division of the country set between developed and underdeveloped countries is something I will apply on my empirical studies as a mean for distinguishing between horizontal and vertical FDI.

In 2014 was Duval and Utoktham conducting an empirical study for ESCAP where they according to the knowledge capital model compared the level of skilled labour in the country sourcing FDI compared to the receiving country. By using a gravity model, they found that the relative skilled labour endowments were positive and significant for FDI which supports vertical FDI theory through the fact that skilled labour abundant countries invest in countries with a larger share of unskilled labour. Hence, will I only use developed countries as my source countries in this thesis. The authors do not make any distinction between horizontal and vertical FDI in their empirical estimation but they nevertheless find a strong link between trade facilitation and FDI.

Based on this previous research will explanatory variables explaining market size, skilled labour abundance and degree of country development probably be important for the way trade facilitation is affecting the type and size of Foreign Direct Investments.

5. Method

The research approach for this thesis is based on Olofsdotter and Persson's (2013) and Blonigen and Wang's (2004) empirical work. I am using a gravity model in its multiplicative form to show the bilateral investment flows between developed source countries and a wide range of countries in the world between 2003 and 2012. I am using a fixed effects Poisson Pseudo-Maximum-Likelihood estimation to examine the effect trade facilitation has on horizontal and vertical FDI. In order to observe these effects are the host countries divided into subsets depending on market size and level of development.

5.1 Empirical Model

FDI data is traditionally treated with a gravity model which is the method I will use in this thesis. The gravity model observes bilateral FDIs between countries and shows how big markets make larger investments due to their size. If the distance between the countries is small, the investment flows will also traditionally be bigger, which can be compared to Isaac Newton's law of gravity. This model has been further developed with variables for cultural and geographical similarities between the trading economies (Santos Silva and Tenreyro, 2006). My baseline model is:

$$FDI_{ijt} = \exp(\beta_1) Days_{jt}^{\beta_2} GDP_{it}^{\beta_3} GDP_{jt}^{\beta_4} Population_{it}^{\beta_5} Population_{jt}^{\beta_6} \\ Distance_{ij}^{\beta_7} \exp(\beta_8 Language_{ij} + \beta_9 Colony_{ij} + \beta_{10} Landlocked_j) \\ \exp(\mu_{ij} + \lambda_t) \varepsilon_{ijt}$$

My dependent variable is the bilateral FDI_{ijt} outward flows in 2005 constant US dollars, where i represent the source countries which in this case is the EU-27 countries¹, the United States and Japan. The subscript j represent the 188 various countries host countries in the world where investment flows have been observed. The subscript t shows that the flows vary over time and thus makes this data panel. According to my hypotheses are these developed countries suitable as source countries since they usually make more investments abroad and are on average skilled labour abundant. Developed countries are also more reliable in terms of data collection than developing countries.

¹ Intra-EU Bilateral Trade Agreements are to a certain extent still in use within the European Union. This is explained and controlled for in Appendix, table A.4.

The variable of interest is $Days_{jt}$ which represent the number of days it takes to comply with trade procedures when exporting from the host country to a foreign destination.

The variables for GDP and $Population$ are supposed to capture the market size. On the matter of horizontal FDI will the GDP of the source and the host country hypothetically affect FDI positively since this kind of FDI is mainly apparent between large countries of similar size. Since the source countries are all developed countries should a larger host country market attract more horizontal FDI (Blonigen and Wang, 2004). In the case of vertical FDI should GDP , according to earlier mentioned Artige and Nicolini (2005), not have an impact on FDI. The expected effect on both horizontal and vertical FDI from $Population$ will be positive in the host country case since a large population can represent a large market as well as a large labour force (Resmini, 2000). I choose to split GDP and $Population$ in my baseline model and not use GDP per capita as some other scholars do. I believe that the firms' investment decision regarding FDI mainly depend on the financial market value in the country. Hence, will the income level of each citizen not affect the FDI (Chakrabarti, 2001).

The traditional gravity variable $Distance_{ij}$ is expected to affect FDI negatively. This would be particularly apparent if the host country is being used as an export platform where the goods should be exported back to the source country or if the production is fragmented. If the market where the good will be sold is close to the production site, on the other hand, is the distance between the source and host country less important (Ramondo, et. al., 2011).

The model is extended with dummy variables such as $Language_{ij}$, $Colony_{ij}$ and $Landlocked_j$. These dummies are taking the value 1 if the countries have a common language, have had a colonial relationship in the past or are landlocked and 0 otherwise. The $Language_j$ dummy should be positive for FDI since a shared language when investing, facilitates the communication and investors experience a stronger trust. This variable can in addition work as a proxy for other cultural similarities along with $Colony_{ij}$ which represents whether the two countries have had a colonisation relationship in the past. It is however quite rare that countries share language or have a colonisation relationship which often makes these variables insignificant (Rose and Spiegel, 2004). The variable $Landlocked_j$ is particularly important for

the host countries functioning as export platforms. Being landlocked means that you have to comply with high costs of overland transports and the excessive time and money it takes to cross several international borders would affect FDI negatively for these countries (Radelet and Sacs, 1998).

The variable μ_{ij} is capturing the bilateral fixed effects of the host and the source country and λ_t is capturing the time-specific effects on the world market. ε_{ijt} is a disturbance term.

My method for observing the vertical and horizontal FDIs is to divide the sample of host countries by:

1. Market size, depending on the host country's GDP.
2. Level of development, depending on OECD membership.

To observe these effects, I am using an interaction variable which is in the first case consisting of the host country group with the largest market size, measured by GDP, times the days to export variable ($GDP_{jhigh} * Days_{jt}$). This variable shows the difference trade facilitation will make on FDI in large markets compared to small markets. Hence will the $Days_{jt}$ variable represent the vertical FDI while the horizontal FDI will be represented by the sum of $Days_{jt}$ and the interaction variable $GDP_{jhigh} * Days_{jt}$. The expected value for the $Days_{jt}$ coefficient is negative while the expected value for $GDP_{jhigh} * Days_{jt}$ is positive. According to theory can their summarized value still be negative since it suggests that trade procedures are negative for vertical FDI but less negative or positive for horizontal FDI.

In the second case where I want to see how the level of development in a country affects the investment purposes, I group my host sample in two groups where the countries in the first group are members of the OECD while the countries in the other group are not. I choose to make this distinction since theory suggests similar countries, and in particular developed countries, being subject to horizontal FDI while underdeveloped countries are more likely hosts of vertical FDI, which is also supported by the study made by Blonigen and Wang (2004). In this case I use the interaction variable in the same way as above, but instead of showing the differences between countries depending on market size I only include OECD members in this variable.

5.2 Estimation

When handling trade data a range of different problems can occur which will bias the results. In order to fairly analyse the results, awareness need to be taken on these issues. These problems can also be handled by econometric methods and robustness checks, where the aim is to treat the data with different methods that are still generating similar results. Below will an explanation follow that describes these potential problems and how to deal with them.

The flows of Foreign Direct Investments are not always observed and these flows are certainly not occurring between all countries in the world. Hence is my data set including many missing values and zero-trade values. If a distinction cannot be made on whether these values are actually zero-trade values or just missing, the model cannot be estimated with a traditional log-linear OLS since the logarithm of zero is non-existing. These observations could neither be dropped since the investment flows in the world would then look much greater than they actually are. The negative trade values included in my data are however difficult to interpret and are thus removed. Since we cannot use the log-linear OLS in this case, the Pseudo Poisson Maximum Likelihood (PPML) estimator is one of the most established estimators for this kind of data. The PPML estimate levels of trade and therefore should the dependent variable not be logged (UNCTAD, 1998). In an established and influential paper by Santos Silva and Tenreyro (2006) are other perks of the PPML estimator described. The common problem of heteroskedasticity in trade data will for instance be robust. I am also using robust standard errors to further control for this.

5.2.1 Endogeneity

Endogeneity is a problem that sometimes occur in gravity models and can be hard to detect. This is mainly because the variables affecting FDI are not exogenous, meaning that improved trade facilitation does not necessarily increase FDI since many other factors are also affecting the investments between countries, such as a long tradition of trade that could improve trade facilitation. This is called a reversed causality problem where we cannot know whether trade facilitation has affected FDI or if a change in FDI is causing changes in trade procedures. Another possible reversed causality case could be when a country increases its growth due to large FDI inflows and invest this surplus in trade facilitating procedures, such as more efficient machines and less manual work. In this case is it the FDI inflows leading to trade facilitation and not the opposite as is being assumed in the model. The evidence for reversed causality is however not very strong but should be kept in mind when analysing the results.

Endogeneity can also occur due to an omitted variable bias where explanatory variables are excluded from the model, such as cultural similarities, long trading history, geographically close location or other variables that are hard to observe. When endogeneity exist, these unobserved factors are captured in the error term which will in turn correlate with some explanatory variables. I am reducing the likelihood of omitted variable bias in my model since I am including the traditional gravity variables, such as distance, common language and colonisation relationship, to capture effects that are usually hard to quantify (UNCTAD, 1998).

Omitted variable bias can also be treated with bilateral fixed effects, which captures the treaties that are constant over time for a specific country pair. Time-specific effects will capture the changes that can occur if the economy is being hit by a shock (Olofsdotter and Persson, 2013; Baltagi, 2008).

5.2.2 Misreported data

As I mentioned in the beginning of section 5.2 is the data set including a mix of missing values and zero investment flows for the dependent variable FDI. This should be kept in mind when interpreting the results since some of the missing values could actually be zero-investment flows while other are unregistered positive values could have been approximated to zero (UNCTAD, 1998). I check for this by making a robustness check where I change all missing values to zero-investment values in order to see if this would affect the results. This robustness check can be observed in table A.1 in Appendix.

Since I have included almost every country in the world in my dataset the risk is quite large of having measurement errors for any variable in the sample. I browse through my sample manually to detect such possible errors as this type of missing value is often “sandwiched” between two high values for the same country pair. Such observations are typical evidence of misreported data (UNCTAD, 1998). Since the reporting countries in my sample are highly developed is the risk of misreported data however relatively small.

5.3 Data

The data I have used for my dependent variable is retrieved from Eurostat (2016). I have chosen FDI outflows from the EU-27 countries, the United States and Japan to all available countries in the world. Data on investments from all countries to all countries does not exist but according to theory will this not be a problem. Since developed countries are the dominating investors abroad are the EU-27 countries, Japan and the United States a good sample for measuring these flows as they are highly developed countries and varying in size. Data on trade facilitation is only available from 2003 to 2012 which is why I pick these years to be my sample period.

My variable of interest, *days to export* in the host country, is retrieved from the World Bank along with data for GDP in 2005 constant US dollars, total population, average annual wage, level of infrastructure and corruption index (World Bank, 2016). The typical gravity-variables, such as bilateral distance (border to border), common language, whether the host country is landlocked and the colony relationship between the countries are retrieved from CEPII (2010).

6. Results

In this section will the results from the regressions be presented in tables. Table 1 demonstrates the Poisson estimation of my baseline model where I am dividing the sample in groups depending on the market size (GDP) of the FDI receiving country. In Table 3 is the sample divided in two groups, subject to whether the FDI receiving country is a member of the OECD or not which is accounting for the level of development in the host country. Finally, will some robustness results be presented by the end of the chapter. The first robustness check is an extended model where control variables originating from the knowledge-capital model are being included along with other variables that could work as determinants for FDI. I am also presenting a negative binomial regression which is an alternative estimation method to the Poisson estimation. The explanatory variables varying over time are logged in all regressions and hence should their coefficients be interpreted as elasticities.

6.1 Poisson Regression of Baseline Model with Market Size-grouping

In the following Table 1 is the *days to export* variable showing the effect trade procedures on small markets has on Foreign Direct Investments. The interaction variable *days to export*largest market* is the difference between the effects on the smaller and the larger market. Hence does the value from this variable need to be added to the value of *days to export* in order to show the total effect from trade procedures on FDI on the larger markets. Since the large and the small markets will have inflows of both vertical and horizontal FDI are these variables trying to indicate how a smaller market will be affected by trade procedures affecting vertical FDI and subsequently how trade procedures on larger markets can affect horizontal FDI. The first column in Table 1 shows the effects from *days to export* on all markets and is thereby showing the overall effect from trade procedures on FDI. In the following column are the countries divided into two markets and furthermore 3 and 4 markets. In the two latter cases are the “middle markets” taken out from the sample in order to see how the countries, who according to theory should receive a majority of horizontal or vertical FDI inflows, react to trade facilitation.

Table 1. Regression Results from Baseline Poisson Estimation²

Dependent variable: FDI Explanatory variables	All markets FDI	Two types of markets	Three types of markets	Four types of markets
GDP source country	-0.695 (1.584)	-0.633 (1.594)	-0.466 (1.658)	-0.442 (1.609)
GDP host country	0.504*** (0.0412)	0.433*** (0.0375)	0.355*** (0.0370)	0.286*** (0.0375)
Population source country	2.596 (2.505)	2.665 (2.556)	2.517 (2.254)	2.255 (2.348)
Population host country	-0.0593 (0.0378)	-0.0485 (0.0361)	-0.00775 (0.0364)	0.0258 (0.0358)
Distance	-0.343*** (0.0565)	-0.313*** (0.0561)	-0.294*** (0.0542)	-0.281*** (0.0529)
Common language	0.0783 (0.138)	0.120 (0.131)	0.0600 (0.106)	0.0125 (0.104)
Colonisation relationship	0.665*** (0.143)	0.652*** (0.140)	0.573*** (0.133)	0.504*** (0.149)
Landlocked	0.136* -0.695	0.220*** (0.0850)	0.226** (0.0892)	0.188* (0.0992)
Days to export	-0.373*** (0.0824)	-0.672*** (0.0923)	-0.900*** (0.0743)	-1.059*** (0.0752)
Days to export*largest market		0.321*** (0.0434)		
Days to export*largest market			0.564*** (0.0601)	
Days to export*largest market				0.670*** (0.0753)
Observations	29,423	29,423	19,601	15,257
Time fixed effects	Yes	Yes	Yes	Yes
Source country fixed effects	Yes	Yes	Yes	Yes
Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1				

Note: In the first column are all countries in the set included. In the subsequent columns are the host countries being divided by market size, measured by their GDP. In column 2 is the set divided in two markets and in column 3 into three markets, where the middle market has been taken out of the set. The same has happened in column 4 but in this case has both middle-market-groups been dropped.

² Robustness checks for this estimation can be observed in appendix where the regression has been estimated with OLS. There is also an estimation where missing values has been replaced by zeroes and an estimation where there are no intra-EU FDI flows in appendix.

Table 2. Trade Procedure’s Impact on Large vs Small markets.

Days to export’s effect on:	All markets	Two markets	Three markets	Four markets
Large markets	-0.373***	-0.351***	-0.336***	-0.389***
Small markets	-0.373***	-0.672***	-0.900***	-1.059***

Table 2 shows how Foreign Direct Investments are affected by trade procedures on large and small markets respectively. Since both markets receive both vertical and horizontal FDI should the values of the coefficients not be taken in too much consideration as the interest of this outcome is the difference between the two different types of markets. Trade procedures are affecting FDI negatively overall which can be observed in the first column where all markets are taken observed. In the following column, when the sample is divided into two markets, are the small markets more negatively affected by trade procedures than the large markets. When the market division is becoming more extreme is this difference even greater. This implies, according to my hypotheses, that large markets receive horizontal FDI to a larger extent than smaller markets, and on the other hand are smaller markets receiving more vertical FDI than large markets. The remaining significant explanatory variables in this baseline model are taking their expected values.

The results in Table 1 has been compared to previous research (Olofsdotter and Persson, 2013) and provides similar results. Tables with robustness checks for this model can be viewed in appendix where table A.1 describes how all missing values have been exchanged to zero since zero trade values implicate that there is no trade between these countries and hence the effects are becoming stronger when some missing values actually are misreported data. The similarities in these results implicate that the majority of the missing values in fact represent no trade and therefore prove robustness. In Table A.3 has intra-EU investments been excluded from the sample. Intra-EU trade could be a potential bias to the results since several agreements on intra-EU bilateral trade (BITS) were closed before the EU enlargements in 2004, 2007 and 2013. The purpose of these BITS was to protect investors when investing in other EU-countries, due to historical political reasons. After the EU enlargements were the BITS no longer considered necessary since all member states were facing the same rules on the EU single market. Nevertheless have these BITS only been phased out successively and have still not really come to an end (European Comisson, 2015). Hence, could intra-EU investments potentially bias my

results due to the shifts in rules of investment for certain country pairs. The results from this estimation are however very similar to the results in Table 1 and remaining BITs should thus not be biasing the baseline results.

6.2 Poisson Estimation of Baseline Model with OECD-grouping.

In the following Table 3 is the sample divided into groups aiming to show whether the host country is considered being developed or not. Hence is the sample in the first column divided into one group where all countries are non-members of the OECD and another group where only OECD-members are included. The following columns are in addition divided into market groups for the purpose of observing a stronger effect from trade procedures on FDI depending on whether a developed and large country or a small and underdeveloped country is being observed. The large developed countries should according to theory mainly receive horizontal FDI while the opposite applies to smaller and underdeveloped countries since they should mainly receive vertical FDI.

Table 3. Regression Results from Baseline Poisson with OECD-grouping.

Dependent variable: FDI Explanatory variables:	OECD vs non-OECD	OECD vs non-OECD 3 markets	OECD vs non-OECD 4 markets
GDP source country	-0.698 (1.612)	-0.564 (1.669)	-0.539 (1.607)
GDP host country	0.598*** (0.0403)	0.542*** (0.0425)	0.474*** (0.0403)
Population source country	2.553 (2.543)	2.494 (2.195)	2.134 (2.288)
Population host country	-0.123*** (0.0382)	-0.0804** (0.0403)	-0.0332 (0.0362)
Distance	-0.369*** (0.0595)	-0.348*** (0.0578)	-0.324*** (0.0553)
Common language	0.0780 (0.140)	-0.00163 (0.124)	-0.0377 (0.119)
Colonisation relationship	0.649*** (0.136)	0.583*** (0.129)	0.521*** (0.146)
Landlocked	0.255*** (0.0807)	0.294*** (0.0899)	0.268** (0.106)
Days to export	-0.340*** (0.0785)	-0.310*** (0.0737)	-0.385*** (0.0780)
Days to export*largest market if OECD member	-0.140*** (0.0318)		
Days to export*largest market if OECD member		-0.116*** (0.0297)	
Days to export*largest market if OECD member			-0.0947*** (0.0268)
Observations	29,423	19,601	15,257
Time fixed effects	Yes	Yes	Yes
Source country fixed effects	Yes	Yes	Yes
Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1			

Note: In this table are the host countries being divided if they are members of the OECD or not. In the first column are all countries included. In the subsequent columns is the set divided in three markets dependent on market size, where the middle market is taken out of the set. The same procedure has been made in column 4 but in this case have both middle-market-groups been dropped.

Table 4. Trade Procedures' Impact on Large OECD markets vs Small non-OECD markets.

Days to export's effect on:	Two markets	Three markets	Four markets
Large OECD markets	-0.480***	-0.426***	-0.480***
Small OECD markets	-0.340***	-0.310***	-0.385***

My hypotheses for Table 4 is that receivers of FDI in large OECD markets should be less negatively affected by trade procedures since they would mainly be receivers of horizontal FDI in theory. This could however not be proved since they are surprisingly more negatively affected by trade procedures than small non-OECD countries. An explanation to this result could be that OECD countries are mainly investing in other OECD countries and the majority of the source and host countries in this sample are also members of the European Union. As shown in Table A.2 in Appendix, will a host country EU membership increase the FDI inflows by 0.229%. Hence, could an existing Free Trade Agreement (FTA) benefit vertical FDI even if these investments are made in large and developed markets. This argument is strengthened by other dummies in Table A.2 where the FDI investments are negatively affected when EU countries are trading with Africa and Asia while trade with the host countries in the EU and South East Asia is positive. The OECD countries have namely more and deeper FTAs within these regions than they have in Asia and Africa which could make them invest in more vertical FDI since it can be more profitable than horizontal FDI due to low investment barriers. A similar study made by Blonigen and Wang (2004) also discovered that vertical FDI was more common than horizontal FDI when the FDI inflows in developed and under-developed countries were compared.

6.3 Robustness Checks

6.3.1 Poisson Regression of the Extended Model with Market Size-grouping

The following estimation in Table 5 shows the extended model where the variables *Wage*, *Infrastructure*, *Corruption* and *European Union* have been added to the baseline model which is now divided into two markets. The extended model is aiming to support the theory on fragmentation and skilled-labour intensity in a country from the knowledge capital model and is also aiming to reduce a potential omitted variable bias problem.

The variable $wage_j$ is the host country's average annual wage in US dollar 2014. If $wage_j$ is relatively low will it according to theory attract vertical FDI since low wage is an important condition for being a suitable export platform. When the wage level is relatively high in the

host country it reflects some kind of higher educated labour force which makes horizontal FDI more appealing since more levels of the firm can then be administrated in the host country. It is considered being difficult to create a correct variable for wage, since wages does not only vary amongst countries but also between industries (OECD, 2016).

The lack of good *Infrastructure_j* could certainly be a problem when it comes to vertical FDI since it is more common that underdeveloped countries have bad infrastructure. This issue means that they can become less attractive for investments since it will obstruct the transport of the goods which is also correlated with higher political risk. *Infrastructure_j* is here measured as a logistic performance index which shows the quality of trade and transport-related infrastructure on a scale from 1 to 5 where 1 is low and 5 is high (Demirhan and Masca, 2008).

Free Trade Agreements (FTAs) can be beneficial for trade and investments since tariffs are eliminated and deeper types of agreement, such as the European Union customs union, often implicate improved trade facilitation. In addition are countries traditionally involved in more Free Trade Agreements if they are geographically close. Since my sample contains many observations and the agreements vary greatly in their setup and degree of integration I choose to create a dummy for *EU* as a proxy for Free Trade Agreements. *EU* takes on the value 1 for all host countries that are members of the European Union. Since the EU agreement is a deeply integrated customs union will the coefficient for *EU* probably generate a positive value since it will theoretically increase vertical FDI, due to cheaper and easier trade. The effect on horizontal FDI will probably not be as apparent but since the customs union can be viewed as one large market will the agreement probably affect horizontal FDI in a positive direction as well³.

³ All variables in the model are listed in table A.5 in Appendix where their set-up and expected value is defined.

Table 5. Extended Poisson Estimation with Market Size-grouping

Dependent variable: FDI Explanatory variables:	Add wage	Add Infrastructure	Add Corruption	Add European Union	Add wage, infrastructure, EU
GDP source country	0.274 (1.329)	-1.722 (1.906)	-5.486* (3.180)	-0.672 (1.589)	0.0837 (1.781)
GDP host country	0.243 (0.233)	0.456*** (0.0558)	0.945*** (0.252)	0.426*** (0.0378)	0.319 (0.276)
Population source country	-0.733 (1.805)	1.683 (2.355)	15.88* (8.338)	2.718 (2.550)	-2.722 (2.271)
Population host country	0.0315 (0.249)	-0.0683 (0.0515)	-0.361 (0.219)	-0.0355 (0.0365)	0.0127 (0.280)
Distance	-0.227*** (0.0480)	-0.253*** (0.0501)	-0.759*** (0.160)	-0.237*** (0.0575)	-0.162** (0.0716)
Common language	0.00251 (0.103)	0.0195 (0.150)	0.474* (0.280)	0.132 (0.131)	0.123 (0.154)
Colonisation relationship	0.588*** (0.138)	0.792*** (0.186)	0.262 (0.254)	0.677*** (0.147)	0.775*** (0.205)
Landlocked	0.350*** (0.109)	0.171 (0.109)	-0.139 (0.600)	0.209** (0.0872)	0.225 (0.148)
Days to export	-0.718*** (0.248)	-0.697*** (0.0945)	-0.121 (0.784)	-0.683*** (0.0938)	-0.590** (0.256)
Days to export*largest market (2 markets)	0.259 (0.232)	0.253*** (0.0442)	0.118 (0.0753)	0.311*** (0.0425)	0.0266 (0.202)
Wage	0.0895 (0.228)				0.0726 (0.264)
Infrastructure		-0.111 (0.212)			-0.904 (0.568)
Corruption			0.829** (0.364)		
European Union				0.231*** (0.0702)	0.178 (0.123)
Observations	3,982	4,390	5,105	15,257	1,465
Time fixed effects	Yes	Yes	Yes	Yes	Yes
Source country fixed effects	Yes	Yes	Yes	Yes	Yes
Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1					

Note: In this table are the host countries divided by market size, measured by their GDP. The set is divided into 2 markets.

Unfortunately, are we not getting any significant results on the effects from wage or infrastructure on FDI in this estimation. This is probably originating from the few degrees of freedom and observations since variables with deficient data has been included in the model. A surprising result is however that corruption in the host country would increase the FDI inflows. We can however see that being a member of the EU, will increase the FDI inflows.

6.3.2. Negative Binomial Regression with Market Size-grouping

The baseline model is also being estimated with a negative binomial regression, see Table 6 below. This estimation method is an alternative to the Poisson model, as it is a good measurement for over-dispersed count data, i.e. the large set of zeroes in the sample. This model is used for robustness since we want to see whether the large set of zeroes are driving the results (UCLA, 2016).

These results are very similar to the Poisson estimation of the baseline regression with market size-grouping. In this estimation is the difference between the effects from trade procedures on FDI between small and large markets even bigger than it is for the Poisson estimation. The size of the coefficients should however not be taken into too much consideration. The similarity between the results in the two models are hence strengthening the results in Table 1. The hypotheses that larger markets are less sensitive to trade procedures than small markets holds in this estimation.

The only variables that are showing alternative results in this case is the variables for *GDP source country* and *landlocked*. The effects from the GDP in the source country is in this case positive, which could be a consequence of countries with zero trade having a lower GDP on average. The dummy *landlocked*, which represents a host country's coastal access, shows how a landlocked country would receive more FDI than a country that is not landlocked. This is probably due to the fact that there exist more zero-trade data for countries that are situated by the coast in this sample. These differing variable results should however not make any big difference to the variable of interest, which is *days to export*.

Table 6. Negative Binomial Regression

Dependent variable: FDI Explanatory variables	All markets FDI	Three types of markets	Four types of markets
GDP source country	1.798*** (0.0858)	1.731*** (0.0887)	1.603*** (0.102)
GDP host country	0.660*** (0.0685)	0.0650 (0.0885)	-0.122 (0.0879)
Population source country	-1.144*** (0.0847)	-1.158*** (0.0891)	-1.090*** (0.0975)
Population host country	-0.447*** (0.0757)	-0.192** (0.0861)	-0.0225 (0.0841)
Distance	-0.827*** (0.0574)	-0.584*** (0.0615)	-0.490*** (0.0661)
Common language	0.417 (0.347)	1.160*** (0.414)	0.628 (0.435)
Colonisation relationship	1.000*** (0.244)	0.681*** (0.258)	0.716*** (0.223)
Landlocked	-0.836*** (0.152)	-0.575*** (0.177)	-0.547** (0.213)
Days to export	-0.505*** (0.131)	-1.633*** (0.194)	-2.113*** (0.214)
Days to export*largest market		1.071*** (0.0767)	
Days to export*largest market			1.278*** (0.0961)
Constant	-12.10*** (1.488)	-0.411 (2.034)	4.088* (2.193)
Observations	29,423	19,607	15,260
Time fixed effects	Yes	Yes	Yes
Source country fixed effects	Yes	Yes	Yes
Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1			

Note: In the first column are all countries in the set included. In the subsequent columns are the host countries being divided by market size, measured by their GDP. In column 2 is the set divided in three markets and in column 3 in four markets, where the middle market is taken out of the set.

7. Summary and Conclusion

The aim of this study was to find the effects trade facilitation has on Foreign Direct Investments by dividing the investment flows into vertical and horizontal FDI. Theoretical studies have hypothesized that developed countries will invest in relatively smaller, low-skilled labour abundant countries if trade is being facilitated in these receiving countries. The investment incentives are however not as strong when trade is being facilitated in a host country of similar size where the produced goods are aimed for being consumed domestically. Since previous research has been lacking an empirical estimation on this theory have I been developing a model that accounts for the effects from trade facilitation on FDI through a division of the large set of host countries by market size and state of development. This division was made in order to see the particular effects on horizontal and vertical FDI as a result of facilitated trade, since the data on FDI does not differentiate between the incentives of the investments.

My findings show how the reduced days to export from the host countries are increasing the FDI inflows to both small and large economies. The positive effect is however stronger on smaller markets than on major markets which made these results consistent with hypotheses and previous research made by Olofsdotter and Persson (2013).

The results from the country division based on the host country's level of development did however appear more contradictive in relation to theory. This study showed how developed countries benefit more from trade facilitating procedures than under-developed countries which is a conflict to the knowledge capital model on how low-skilled labour abundant developing countries should attract vertical FDI and therefore benefit more from trade facilitation than large developed countries that would theoretically attract horizontal FDI. An explanation for these results could however be the presence of deeply integrated Free Trade Agreements between developed countries which attracts vertical FDI.

My contribution to this field of research is the method of empirical differentiation between horizontal and vertical FDI when examining the effect trade facilitation has on Foreign Direct Investments. I would strongly recommend further research on this field, especially when the trade facilitating effects on the FDI patterns can be observed over a longer period of time. An interesting aspect will for instance be to analyse how the upcoming Brexit will affect the inflows of Foreign Direct Investments on the UK market, since it implies a step backwards for trade facilitation. Another current trade facilitating debate of interest for this field of research is the

ongoing transatlantic TTIP agreement, which is an agreement that will facilitate trade between two major economies, the EU and North America. Will the investment flows take a vertical character when trade is being facilitated between such large economies, even if it might have been more beneficial to make horizontal investments in the past? I believe that a country being a prospect for FDI could also use this type of research when deliberating the trade-off between facilitating trade and protecting domestic interests by preserving trade procedures.

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Appendix

A.1 Robustness Checks

Table A.1 Regression Results from Baseline Poisson Estimation (All missing values = 0)

Dependent variable: FDI Explanatory variables	All markets	Two types of markets	Three types of markets	Four types of markets
GDP source country	-0.639 (1.614)	-0.601 (1.618)	-0.605 (1.659)	-0.561 (1.605)
GDP host country	0.482*** (0.0343)	0.334*** (0.0375)	0.172*** (0.0510)	0.133** (0.0540)
Population source country	-0.227 (2.649)	-0.200 (2.661)	-0.400 (2.442)	-0.640 (2.502)
Population host country	-0.109*** (0.0345)	-0.0639* (0.0336)	0.00459 (0.0351)	-0.0330 (0.0329)
Distance	-0.121* (0.0667)	-0.0872 (0.0676)	-0.0501 (0.0618)	-0.0141 (0.0558)
Common language	-0.187 (0.159)	-0.123 (0.136)	-0.247* (0.128)	-0.316*** (0.120)
Colonisation relationship	0.563*** (0.175)	0.590*** (0.160)	0.456*** (0.146)	0.387** (0.154)
Landlocked	0.110 (0.0856)	0.307*** (0.0805)	0.355*** (0.0932)	0.331*** (0.105)
Days to export	-0.170** (0.0722)	-0.762*** (0.0743)	-1.214*** (0.0804)	-1.272*** (0.103)
Days to export*largest market		0.563*** (0.0416)		
Days to export*largest market			0.976*** (0.0710)	
Days to export*largest market				1.209*** (0.0982)
Observations	41,840	41,840	27,509	21,306
Time fixed effects	Yes	Yes	Yes	Yes
Source country fixed effects	Yes	Yes	Yes	Yes
Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1				

Note: In the first column are all countries in the set included. In the subsequent columns are the host countries being divided by market size, measured by their GDP. In column 2 is the set divided in two markets, in column 3 in the three markets, where the middle market is taken out of the set. The same has happened in column 4 but here have both middle-market-groups been dropped.

Table A.2 Regression Results from Poisson Estimation with Continent Variables

Dependent variable: FDI	2 markets Africa- dummy	2 markets EU- dummy	2 markets South East Asia- dummy	2 markets Asia- dummy	2 markets All dummies
GDP source country	-0.635 (1.598)	-0.649 (1.593)	-0.630 (1.576)	-0.622 (1.588)	-0.616 (1.563)
GDP host country	0.412*** (0.0434)	0.420*** (0.0383)	0.460*** (0.0353)	0.434*** (0.0397)	0.439*** (0.0464)
Population source country	2.655 (2.557)	2.661 (2.535)	2.595 (2.530)	2.659 (2.571)	2.555 (2.536)
Population host country	-0.0302 (0.0394)	-0.0310 (0.0360)	-0.0724** (0.0339)	-0.0413 (0.0362)	-0.0361 (0.0410)
Distance	-0.318*** (0.0563)	-0.252*** (0.0605)	-0.334*** (0.0558)	-0.291*** (0.0614)	-0.272*** (0.0618)
Common language	0.157 (0.122)	0.135 (0.126)	0.156 (0.139)	0.0934 (0.136)	0.165 (0.132)
Colonisation relationship	0.653*** (0.136)	0.682*** (0.142)	0.630*** (0.143)	0.669*** (0.147)	0.668*** (0.151)
Landlocked	0.212** (0.0841)	0.205** (0.0845)	0.207** (0.0843)	0.223*** (0.0860)	0.196** (0.0841)
Days to export	-0.672*** (0.0928)	-0.675*** (0.0931)	-0.606*** (0.0861)	-0.666*** (0.0938)	-0.581*** (0.0891)
Days to export*large market	0.310*** (0.0407)	0.315*** (0.0427)	0.306*** (0.0432)	0.327*** (0.0448)	0.297*** (0.0412)
Africa	-0.233* (0.132)				-0.252* (0.145)
European Union		0.229*** (0.0670)			0.111* (0.0601)
South East Asia			0.469*** (0.107)		0.661*** (0.128)
Asia				-0.178** (0.0727)	-0.352*** (0.0816)
Observations	29,423	29,423	29,423	29,423	29,423
Time fixed effects	Yes	Yes	Yes	Yes	Yes
Source country fixed effects	Yes	Yes	Yes	Yes	Yes
Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1					

Note: In this table are the host countries being divided into two markets, measured by their GDP.

Table A.3 Regression Results from Baseline Poisson Estimation without Intra-EU Trade

Dependent variable: FDI Explanatory variables	Two types of markets	Three types of markets	Four types of markets
GDP source country	-1.561 (2.418)	-1.538 (2.413)	-1.480 (2.051)
GDP host country	0.532*** (0.0397)	0.387*** (0.0431)	0.238*** (0.0488)
Population source country	5.885 (4.497)	6.072 (4.018)	5.442 (3.862)
Population host country	-0.0723** (0.0354)	-0.00820 (0.0390)	0.0745* (0.0382)
Distance	-0.331*** (0.0674)	-0.331*** (0.0685)	-0.357*** (0.0675)
Common language	0.293** (0.121)	0.143 (0.131)	0.164 (0.178)
Colonisation relationship	0.385** (0.150)	0.334** (0.155)	0.264 (0.197)
Landlocked	0.165 (0.196)	0.386 (0.248)	0.402 (0.291)
Days to export	-0.460*** (0.0953)	-0.819*** (0.109)	-1.087*** (0.102)
Days to export*largest market	0.241*** (0.0476)		
Days to export*largest market		0.531*** (0.0768)	
Days to export*largest market			0.736*** (0.0872)
Observations	25,461	15,854	10,879
Time fixed effects	Yes	Yes	Yes
Source country fixed effects	Yes	Yes	Yes
Robust standard errors in parentheses			
*** p<0.01, ** p<0.05, * p<0.1			

Note: In the first column are all countries in the set included. In the subsequent columns are the host countries being divided by market size, measured by their GDP. In column 2 is the set divided in two markets, in column 3 in the three markets, where the middle market is taken out of the set. The same has happened in column 4 but here have both middle-market-groups been dropped.

Table A.4. OLS Regression of the Baseline Model with Market Size-grouping

Dependent variable: FDI	All markets	Two types of	Three types of	Four types of
Explanatory variables	FDI	markets	markets	markets
GDP source country	0.187 (1.320)	0.194 (1.324)	0.654 (1.361)	0.885 (1.264)
GDP host country	0.484*** (0.0689)	0.454*** (0.0705)	0.385*** (0.0699)	0.296*** (0.0702)
Population source country	1.275 (2.057)	1.301 (2.076)	0.934 (2.208)	0.821 (2.438)
Population host country	-0.118*** (0.0382)	-0.113*** (0.0383)	-0.0835* (0.0459)	-0.0211 (0.0511)
Distance	-0.474*** (0.0545)	-0.462*** (0.0532)	-0.444*** (0.0587)	-0.455*** (0.0626)
Common language	0.200 (0.194)	0.226 (0.196)	0.144 (0.215)	-0.0477 (0.270)
Colonisation relationship	0.570*** (0.174)	0.584*** (0.169)	0.363** (0.173)	0.364* (0.213)
Landlocked	-0.0293 (0.0925)	0.00408 (0.0919)	0.0210 (0.0976)	-0.0608 (0.123)
Days to export	-0.325*** (0.0819)	-0.397*** (0.0861)	-0.480*** (0.120)	-0.679*** (0.157)
Days to export*largest market		0.0741 (0.0524)		
Days to export*largest market			0.182** (0.0885)	
Days to export*largest market				0.226* (0.127)
Constant	-14.94 (45.34)	-14.92 (45.62)	-19.73 (50.48)	-22.08 (51.62)
Observations	9,116	9,116	6,696	5,420
R-squared	0.267	0.268	0.271	0.270
Time fixed effects	Yes	Yes	Yes	Yes
Source country fixed effects	Yes	Yes	Yes	Yes
Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1				

Note: In the first column are all countries in the set included. In the subsequent columns are the host countries being divided by market size, measured by their GDP. In column 2 is the set divided in two markets, in column 3 in the three markets, where the middle market is taken out of the set. The same has happened in column 4 but here have both middle-market-groups been dropped. All continuous variables, including FDI, are logarithmised.

A.2 Variable Explanation

Table A.5 Variable Explanation and Their Expected Value

Variable	Interpretation	Expected value
Dependent variable: FDI	The amount of foreign direct investments that flows from source country to host country measured in constant 2005 US dollar	
GDP source country	The logarithmized GDP value for the investing country in constant 2005 US dollar	Positive
GDP host country	The logarithmized GDP value for the receiving country in constant 2005 US dollar	Positive
Population source country	The logarithmized total population in investing country	Positive
Population host country	The logarithmized total population in receiving country	Positive
Distance	Logarithmized bilateral distance border to border between source and host country	Negative
Common language	Dummy variable for whether the countries share a common language	Positive
Colonisation relationship	Dummy variable for whether the countries have had a colonisation relationship	Positive
Landlocked	Dummy variable for whether the host country is landlocked	Ambiguous
Days to export	The number of days needed to comply with all procedures necessary to export a product from the host country	Negative
Days to export*large market	The number of days needed to comply with all procedures necessary to export a product from the host country times the logarithmized FDI value for the largest market	Positive
Days to export non-OECD market	The number of days needed to comply with all procedures necessary to export a product from the host country for a non OECD-market	Negative
Days to export*OECD market	The number of days needed to comply with all procedures necessary to export a product from the host country times the logarithmized FDI value for an OECD market	Positive
Days to export*HostGDP	The logarithmized number of days needed to comply with all procedures necessary to export a product from the host country*the logarithmized value for host GDP	Positive
Wage	The logarithmized value for average annual wage in constant 2014 dollar	Ambiguous
Infrastructure	The logarithmized value for logistics professionals' perception of country's quality of trade and transport related infrastructure on a rating ranging from 1 (very low) to 5 (very high),	Ambiguous
Corruption	The logarithmized value for CPIA transparency, accountability and corruption in the public sector rating (1=low to 6=high)	Negative
European Union	Dummy variable for whether the host country is a member of the European Union or not	Positive
Africa	Dummy variable for whether the host country is an African country or not	Negative
South East Asia	Dummy variable for whether the host country is a South East Asian country or not	Positive
Asia	Dummy variable for whether the host country is an Asian country or not	Ambiguous