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Foregin Direct Investment and competition from low wage countries

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Abstract

Foregin Direct Investment, FDI is often seen to be an important factor to economic growth across the globe. It gives Multinational Enterprises the opportunity to come closer to their customers, but also a chance to achieve economies of scale. In the same way that FDI is considered to benefit a company, economists are also discussing the impact that it brings to the local market. Investments in China and Eastern Europe have increased significantly in the last decade and sometimes it can be argued that workers in industrialized countries are in competition with those in low wage countries. I examine a sector level panel of FDI inflows between low wage and high wage countries and find evidence that suggests that labor cost is a great determinant to localization of production. The result supports the vertical perspective of the Knowledge Capital model in the sense that the inflow of FDI will increase when labor cost is relatively cheap. In addition I confirm the theory of the gravity model that when distance between countries increases, the flow of FDI decreases. The result puts attention to the importance of MNEs responsibility in employees working conditions and not to take advantage of cheap labor and poor working conditions when locating production across the globe.

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1. Introduction

It is often discussed that globalization places workers in high wage countries in competition with those in low wage countries. Globalization of production on a firm level is an under-researched and important debate which is impacting localization of production and wages across the globe. Multinational Enterprises (MNE) are usually classified to be of the horizontal or vertical nature depending on their affiliate operations. The knowledge capital model, developed in Markusen and Maskus (1999 & 2001) combines "horizontal" and "vertical" motivations for FDI and is therefore driven by both market access and factor cost. The horizontal motivation desires to locate production near the customer in order to avoid trade costs, meaning that firms will replicate their production in more than one country. The vertical motivation seeks to carry out unskilled labor intensive production tasks to locations with high rates of unskilled labor, which means that the firm fragments their production to different stages, and desire to gain from international factor price differences. (Markusen and Maskus (1999 & 2001))
One of the still not explained parts from previous literature is within the vertical perspective, to understand and prove how important labor cost can be within production and explain why MNE:s relocate their production to lower-wage countries. One of the reasons why previous literature seems to have shown little evidence of the vertical motivation of FDI is that relative labor endowments doesn't have a direct impact on MNE:s sales of foregin affiliates. (Blonigen et al.., 2002). In reality it can also be hard to identify a MNE to strict vertical or strict horizontal since they are usually driven by both market access and production cost. Consequently I will in my report investigate if FDI is sensitive to relative factor cost and in order to do so I will exchange relative factor endowments to relative factor cost in my study.

My empirical question is:
How well can FDI inflows be explained by relatively low labor cost?

In the study I will empirically investigate what significance labor cost has by applying data on country minimum gross wages to represent the skill premium in the model. I will use bilateral

FDI inflow data from OECD and include FDI inflows from all OECD countries. The observations included in the report are in total 10.154 and covering a time-frame from 2010 to 2018. In the testing I will include additional test variables to control for other factors determining the location of FDI.

2. Theory

The global interest in multinational enterprises, “MNE" has increased significantly in the last decade for two reasons. The first reason is that the flow of foregin direct investment, FDI, which is the defining activity of multinational enterprises, has grown during the last two decades in faster growth than international trade and world output. The main reason why the flow of FDI has grown significantly is due to the integration of East-europe and China in the world economy, trade liberalization, technological developments and globalization. The second reason why interest in MNE has increased is that there has been a greater debate on the effects of FDI especially with focus on the effects in the labor market. This is becoming a debate because more companies choose to move their production to low-wage countries to achieve greater economies of scale. Normally MNEs and FDI are seen to be beneficial for local development, however economists have argued that FDI is bringing social concerns and that MNEs are taking advantage of low wages and weak working standards when placing production in developing countries. (OECD 2008). One of the main characteristics of the Knowledge capital model by Markusen and Maskus (1999 & 2001) explains how multinational companies are affected by the distinction between skilled and unskilled labor within the home and host country. The model is therefore relevant because it is suggesting many contrasting motives of FDI and thus different labor market effects. One example is that affiliate activity in different countries is not as likely to impact the unskilled labor workers in the home country negatively in the horizontal model than in the knowledge capital model.

In the model there are two countries; home and foregin, two factors of production; unskilled and skilled workers and two goods; we can call them x and y. According to the model good X is

being produced with growing return to scale and with a three-stage process of production. The stage starts with a firm that must undertake HQ activities such as management, R&D, accounting or elsewhere and this is generating a firm-level fixed cost. The second stage is that plant-level fixed costs are being incurred and in the final stage production takes place.

Assuming that HQ-activities are more skilled-labor intensive in production of good X (we assume good X is more skill-intensive than production of good Y) three types of firm can emerge:

- Vertical multinational enterprises slice up the value chain by dividing the labor force and locating high skilled labor intensive tasks in the high-skilled country while the location of low skilled labor tasks will be in the low-skilled labor country. This type of firm exports their production also to the home country.
- Horizontal multinational enterprises tie their HQ activities to their plant and duplicate production in the host country. In difference to the Vertical enterprises, the horizontal MNEs sell their production locally.
- National firms are the third type of firm within the model and it is based on solid production in the home country and export to the foreign markets.

(Carr, Markusen, Maskus, 2001)

The predictions just described are illustrated in Figure 1. The figure is taken from Braconier et al. (2003) and shows simulated levels of affiliate sales for country i in country j. On the vertical and horizontal axis Braconier et al. is showing the country endowments of skilled and unskilled workers where s_i represents the home country share of skilled labor and u_i represents the share of unskilled workers. As shown in figure 1 the host country has its origin in the north east corner while the home country's origin is in the south west corner. The diagonal separating the two can be seen as the breakpoint where in the upper side the home country is rich in skilled workers compared to the host country. In addition the home country's relative economic size is growing along the diagonal. Coming back to the horizontal and vertical FDI, the horizontal FDI will be found in the center of the Edgeworth box since this is where relative country size and relative endowments are similar and the vertical FDI will be found in the North-West corner where the

relative endowments are relatively different. The value of using the Edgeworth box within the Knowledge Capital model is that it connects the size of the countries to their relative endowments in a simple visual way.

As we have now been introduced to the main features of the Knowledge Capital model I would like to draw attention to the vertical motivation. As described by Helpman (1984) the form of a multinational enterprise is mostly driven by endowment differences. Since vertical MNE:s are splitting the labor force in high-skilled and low-skilled workers this will lead to a cost saving for the company. Although to be mentioned that vertical FDI is mostly observed in countries with relatively large endowments with unskilled labor. More studies have been done to test the evidence of the horizontal and vertical FDI of which Riker & Brainard (1997) support the market access and jumping tariff method for the horizontal FDI, while they at the same time find limited evidence on vertical FDI motivated by relative factor endowments. Riker & Brainhard also conclude in their study that within MNEs labor demand in each affiliate relates to the demand and cost of the other affiliates operated by the company. What they also conclude is that US affiliate production is considerably lower in countries with a lower GDP per person, which in the study is used as a measure of skill endowments. (Riker & Brainard, 1997)
Another study where vertical FDI has been rejected is by Markusen and Maskus (1999) where they find no evidence of vertical motivation of FDI and favors the horizontal motivation as explanation for MNE production. In the study they are concluding that the largest proportion of FDI is coming from high-wage and developed countries to a similar high-wage developed country. This means that horizontal FDI is more important for the world economy than vertical FDI, at least the Vertical FDI that are motivated by differences in factor endowments. (Markusen and Maskus, 1999)

Empirical research has found relative labor costs to be significantly important for FDI in industries that are labor intensive but also for export focused subsidiaries. The global interest to invest in China and eastern-Europe has been greatly influenced by the low wages in the countries. This is being observed in the CSR report published by OECD (2008) where they argue

that there is no reason to expect that in most cases, MNEs would offer a higher salary or better labour conditions for their employees then their counterparts locally in the host country (OECD 2008). However in sub-Saharan countries in Africa, productivity is generally lower than in the low-income countries in Asia and ideas about importing foreign workers have in many cases been put on hold due to restrictions and long processing time for work-permits. Lack of staff in these countries is considered to hold back the potential of FDI inflows especially within the manufacturing sector since it decreases the attractiveness of investing in these sectors. (Marr, 1997)

Braconier, Dieter & Norbäck (2002) have studied the relation between FDI and wage costs using outgoing FDI data for US and Sweden. The advantage of their study is that their data greatly increases the coverage of bilateral pairs for the endowment box. In their conclusion they find strong evidence of the Knowledge Capital model and they basically confirm the results presented by Markusen & Maskus. To be mentioned is that their skill-measure differs from the actual endowments for skilled and unskilled labor presented in the Knowledge Capital model, as they are using relative wages between the two groups. (Braconier, Dieter & Norbäck, 2002)

2.1 The empirical model

One of the many explanations of why "nations trade with each other" is given by the Gravity Model of International trade. The model anticipates that the volume of trade between nations will directly be related to the geographic distance between the countries. This translates into an expectation that larger countries (which could be measured by GDP for example) should have a greater activity of FDI then smaller countries. The expectation of the model is also that greater geographical distance should contribute to less FDI activity. Previous literature finds that the gravity model of international trade is among the most robust models to determine FDI flows. (Blondigen & Piger, 2011) For this paper the GMIT model can help interpret the effect of different trade variables such as size of economy, distance, labor costs and communication barriers.

In general the gravity equation can be written as the following:

$X_{ij} = GS_iM_j\varnothing_{ij}$

Where X_{ij} shows the monetary value of export from i to j. G is a variable neither dependent on i or j. S shows the exporter specific factors and M the importer specific factors. Last but not least $\varnothing$ represents the ease of the exporter to access market J (meaning the inverse of bilateral costs of trade).

This report makes new contributions compared to the studies done previously in the field. Firstly I use data provided by the international labour organization Ilostat to represent the skill wage premiums for high skilled and low skilled workers. As previously discussed Braconier et al. also used wage data to replace skill endowments, however in their study they used data provided by UBS. The other contribution is that I am using FDI inflow data from all OECD countries but also adding additional low wage countries besides the OECD countries, in order to generate as many observations for my regression as possible. My observations will first be tested on total level with all observations together, but will in a later stage also be divided up into low-wage and high-wage countries to see if the coefficients have a stronger liaison in one of the target groups. By doing this split, I will be able to look at FDI inflows from high wage to low wage countries, from low wage to high wage countries, from low wage to low wage countries but also from a high wage to another high wage country, where the later was the theory presented to be strong by Markusen and Maskus (1999). I am in my tables focusing on the Nordic and Baltic countries as these countries are of specific interest for me in my professional work and are also relevant for my thesis since they are including both low and high wage countries. In previous literature MNE activities have been focused on two countries, a host and a home, for example Swedish and US FDI flows, however my study is taking more countries into account as I am not investigating the flow only for two countries.

3. Data

Many of the previous studies done on FDI and relative endowments are using inward and outward FDI data for the US. The economy in the US is without doubt the largest economy in

the world. This has previously been illustrated by Braconier et al. (2002) in their edgeworth box using inward and outward FDI observations. In figure 2 we can see the edgeworth box presented in the report done by Braconier et al. with the division of bilateral endowments of unskilled and skilled labor for the US and their host countries. In the figure we can see that the US is larger then the host or home country considering that we see the massive amount of outward observations in the NE corner and the same massive amount of inward observations in the SW corner. (Braconier et al., 2002) However I will as previously mentioned in my report include more countries in my observations and will not have my focus solid on the US. The background of choosing FDI inflows of all OECD countries and adding additional low wage countries into the observation is because OECD provides bilateral data on these countries but also because the countries include both high wage and low wage economies. This allows me to split the data into high wage and low wage countries in my testing to see if labor cost is a determinant of FDI in both sectors and if my test variables are impacting both sectors the same way.

As Braconier et al (2002) also were showing in their studies, I will now highlight why wage-premiums can be useful in the Knowledge Capital model. According to the model the MNE:s relative factor cost is at a large scale influencing exports to the home country. The result of this is that vertical FDI in some cases is being defined as these exports back to the home country and also then determining the part for factor cost in explaining FDI. If we would divide the production into steps as suggested by Venables (1999) and also done by Braconier et al., we can increase the scope for explaining FDI with factor costs. We start by assuming that the production of MNE can be divided into skilled-intensive tasks and unskilled intensive tasks. In this example home MNE:s have a higher possibility of conducting unskilled intensive tasks only in the home country if the relative costs of unskilled tasks are high in the host country, not taking into account trade costs and size of markets.(Braconier, Dieter & Norbäck, 2002) This can be shown in table 1 where jobs have been divided into low skill jobs and high skill jobs and we see the average salaries for six countries in North Europe and Baltics. Looking at the average salaries for Russia, we can conclude what was just stated that it would not make sense for Russia to produce their unskilled tasks in one of the host countries presented in this example as this would increase their labor costs. However if the relative costs of unskilled tasks were cheaper in the

host country, we should expect more unskilled tasks to be performed in the host country and affiliate imports of goods from the MNE parent company. Going back to table 1, the MNE would for example gain by moving unskilled production from Denmark to Russia if these would be the home and host countries in scope. This example will be introduced again in my regression analysis later on, however there I will include additional test variables to control for other determinants of FDI since labor cost seldom will be the single determinant.

According to Braconier et al. (2002) vertical motivations within MNE:s can occur even if the host country only sells the final good in their local market. However, both the local market and the exporters can be affected by factor costs within the vertical integration where the sensitivity for relative factor costs is expected to be greater for exporters of affiliate production than for the local sales. In addition, Braconier et al. highlights that affiliate imports from parent companies in the MNE home country is another good measure of FDI of which is depending on the relative factor costs. (Braconier, Dieter & Norbäck, 2002) In my analysis I will however not distinguish between where the final good is ending up, meaning I will not separate FDI in goods of sales that is ending up in the local market, being exported back to the home country or being sold to a third economy. My testing will only consider the total FDI inflow and instead I will deepen the analysis on the relative skill endowments and to include both high wage and low wage countries in the data.

3.1 Measures of Skill-endowments

In order to facilitate the difference in the relative skill-structure between the countries and to connect this with the relative skill wages, data are obtained from the international labor organization Ilostat and in table 3 I am reporting the employment rate within the manufacturing sector out of the total working force in the same countries as presented in table 1. The panel data reports the percentages of the workforce working in manufacturing jobs for the years 2010-2019. In the data we can see that Russia and Estonia have the highest share of employees working in the manufacturing sector while we at the same time saw in table 1 that the wages for low-skilled workers were lowest in these countries. We can directly see that we have a big share of

low-skilled workers in the countries where the wages are lowest for these work-tasks. The relative difference in skill endowments usually referred to as SKR is showing the ratio of skilled workers compared to unskilled workers in the home country relative to the host county. As we are looking at more than two countries in this report I will use the SKR ratio for each country and this ratio can then be used to see which countries are more well- endowed compared to the others.

As described, I will use the relative wage differences for skilled and unskilled workers as a measure of the potential determinant of vertical FDI. As previously done by Braconier et al., this can be done by defining the wage premium which will show the skilled to unskilled salary in the home country related to the ratio in the host country.

Wage Premium= $(w^i_H/w^i_F)/(w^j_H/w^j_F)=(w^j_F/w^j_H)/(w^i_F/w^i_H)$

Where w^i_H and w^i_F represents wages for high-skilled and low-skilled workers in the home country i, and w^j_F and w^j_H represents wages for high-skilled and low-skilled workers in the host country j. This means that the wage premium is high when low-skilled workers in the host country are cheap. In table 1 I am showing the internal wage premium in each country and in order to see the skill differences between the countries, I divide them with each other as shown in the formula above. Observe that the Knowledge capital model is predicting a positive relation between the wage premium and the SKR variable. However there are many reasons why the link between endowments and cost of production may be weak, such as preferences, imperfection in the labor market and distortions. The study from Braconier et al. (2002) shows that the data used for measuring relative factor costs and factor endowments does not have a high correlation and does also highlight the importance of measurement errors. (Braconier, Dieter & Norbäck, 2002)

The data used for the relative wages presented in table 1, is coming from the international labour organization Ilostat which is the focal point to the UN regarding labour statistics. The table shows the average salaries between 2010 and 2019 and salaries are split in low skill jobs and high skill jobs. Low skill jobs include salaries within Manufacturing and Construction work and high skill jobs include salaries for Professional Scientific and Technical activities, Financial and Insurance activities and Information and Communication jobs. The advantage of using this data

is that we can divide the labor force into two groups to measure the skill-level in our chosen countries and this will be done in my in-depth analysis. As previously mentioned I will in my testing include more countries then the countries presented in table 1 and for the testing I will use both the home and host country wage to calculate the wage premium. In addition I will in my testing use a more general wage premium which is being represented by the country minimum salaries also provided by Ilostat.

3.2 Measures of MNE activity

To measure the MNE activity in the report I am using bilateral data on FDI inflows from OECD which is a measure of total flows of FDI by partner country within a year. This will be used as my dependent variable. I am using data between 2010 and 2018 and will include the flows by partner country, reported in million USD. The countries in scope besides the OECD countries are Russia, South Africa, Argentina, Brazil, China, India, Indonesia, Malaysia & Vietnam, which means that I am reporting the FDI flows to these countries from all OECD countries. The home and host countries are then divided into low wage and high wage countries. The benefit of using bilateral data is that I can connect the data to my other variables (GDP, distance, common language etc) and report the variables both in the home and partner country. The reason why I am using FDI inflows instead of FDI outflows is because I want to understand the effect of a countries wage-premium in relation to the relative share of investment in the country. Since the essential gravity model of FDI was estimated with Ordinary Least Squares (OLS) I will also use this estimation model throughout this paper. Since OLS comes with the obstacle of zero trade flow, I will also use Weighted Least Squares, (WLS) to see if this estimation model gives me a similar result.

3.3 Additional explanatory variables

In addition to wage premiums and FDI data I will include additional variables to control for other factors determining the location of FDI. GDP and GDP per capita provided by the World Bank are two of the additional test variables that will be used in the regression and the benefit of using

these is that they are taking the country size and growth into account. The other test variable that is used is the country distance between the home and the host country to see if the geographical location of the countries simply could be a reason for localization of production. As mentioned when describing the gravity model, these variables are important and the expectations are that these variables affect the dimensions of FDI. The data for country distance is taken from CEPII which is a French center for research and expertise in the world economy. Normally common language has been used as a variable in previous literature and also I will use common language provided by CEPII between the home and host country as a dummy variable. This means that if the home and host country speaks the same language the dummy variable will be set to 1 and if the two countries do not speak the same language the dummy variable will be set to 0. By using this dummy variable we can test if common language is a determining variable for location of FDI and since I am splitting the countries into low wage and high wage I will also test if the variable is more sensitive in one of the sectors.

4. Empirical Result

To estimate the result I will as previously described use a general gravity equation and first run it using OLS and secondly run it with WLS. In the equation I am using FDI inflows as my dependent variable and following Brainard (1997) I am estimating a log-linear equation of the data by home and host country at time *t*. This gives me the following equation based on the variables just described:

$$\text{FDI Inflows} = \boldsymbol{\beta}_o + \boldsymbol{\beta}_1 gdp_{it} + \boldsymbol{\beta}_2 gdp_{jt} + \boldsymbol{\beta}_3 gdpC_{it} + \boldsymbol{\beta}_4 gdpC_{jt} + \boldsymbol{\beta}_5 dist_{ij} + \boldsymbol{\beta}_6 wagep_{ijt} + \boldsymbol{\varepsilon}_{ijt}$$

In the equation the lower case letters represent natural logarithms and epsilon the error term. From the equation I am also adding time, home and host dummies in order to control for unknown country and time specific factors, still our independent variable in focus is the skill premium. The reason I am including affiliate dummies is to remove any influence of affiliate characteristics which are fixed at affiliate or even broader level but not being observed in the data. The method for this is that I divide the time panel into binary (0,1) dummy variables for each year where one represents the year currently in scope. For the home and host country

dummies, I am dividing the countries into a binary dummy variable for each country where the variable will be set to one whenever the country we are looking at is in the observation, and will be set to zero otherwise. These country dummies will capture any country specific characteristic and will support the control for a county's general level of exports and imports. Each of these flows are then controlled with the explanatory variables GDP, GDP per capita, distance and common language before testing the wage premium to make the regression more precise.

The new equation including time, home and host dummies is looking like the following:

FDI Inflows= $\boldsymbol{\beta}_o + \boldsymbol{\beta}_1 gdp_{it} + \boldsymbol{\beta}_2 gdp_{jt} + \boldsymbol{\beta}_3 gdpC_{it} + \boldsymbol{\beta}_4 gdpC_{jt} + \boldsymbol{\beta}_5 dist_{ij} + \boldsymbol{\beta}_6 wagep_{ijt} + \boldsymbol{\beta}_7 l_i + \boldsymbol{\beta}_8 l_j + \boldsymbol{\beta}_9 l_t + \boldsymbol{\varepsilon}_{ijt}$

Where l_i and l_j is a binary dummy variable set to one when the country in scope in the observation is i and j and set to zero otherwise. l_t appoint a dummy variable for the specific year in the observation and will only be set to one when we are looking at the specific year.

In my first regression I am testing all the countries at the same time but an alternative form of heterogeneity in the equation could be to allow the slope term $\boldsymbol{\beta}$ to vary within the sample (which would relax the pooling restriction). By doing this I estimate the model of FDI inflow separately for low wage and high wage countries and control for the test variables separately.

What we previously have looked at regarding wages in table 1 is the wage premium calculated by monthly salaries for low skilled jobs and high skilled jobs. The dimension of countries was limited in table 1, however in the regression model I am using *country minimum wages*[1] of all countries included in the estimation to represent the countries salaries. In fact the gravity model connects the natural logarithm of the monetary variable of trade between countries, to the logarithm of each country's GDPs meaning a composite term to measure incentives and barriers to trade in between. Since wage has been separated from location I am able to test if wage is more sensitive in neighboring countries than countries far from our home country.

In table 4 I am presenting the result of my regression when testing all variables at the same time as well as including both developing and industrialized countries in the same regression. In total

[1] The data on country minimum wages provided by Ilostat refers to the nominal gross monthly wage of all employees as of December 31st each year. Minimum wages are not reported for countries of which collective bargaining is in place, however in cases where national minimum wage is not manded, the minimum wage used is the capital or major city used. Wages are converted to US dollars using 2017 purchasing power parity (PPP).

I am testing 10.154 observations and the OLS testing gave me an R value of 0,575 and a R Square value of 0,331 meaning that my independent and dependent variables do have a log linear relationship. In the second testing when I am using WLS my R value is 0,969 and my R Square value 0,939. What is interesting to see is the OLS Unstandardized B value of the WageP 26.675, meaning that as the WageP increases with one unit, my dependent variable (FDI inflow) is increasing with 26.675 million dollar. Since the WageP is showing the difference between the min wage in the home country and the min wage in the host country my testing is showing that when this gap increases, the FDI inflow will also increase. However we also need to check the default value (SIG) to see if the coefficient is statistically significant and here the SIG value is 0,001 which means that my coefficient is statistically significant. Looking at the same result for WLS the Unstandardized B value for WageP is 3425 and also here the coefficient is statistically significant. Mainly we are for the Coefficient interested to see the sign of the Unstandardized B value, since the actual amount (in this case 26.675 and 3425) could be difficult to measure without splitting the observations and comparing in between, which is what I will do in the next step. I also perform a Durbin Watson test and for both the OLS and WLS testing we do not reject the null hypothesis of no correlation between the error terms.

Next, I am dividing the countries into high wage and low wage and controlling for my variables again using OLS. In table 5 I am presenting the key findings of the new testing and by dividing the flows of FDI into sectors I can see that my testing actually has a stronger linear relationship when looking at the flows of FDI from a low wage to another low wage country. In this testing my R value is 0,685 and my R squared value is 0,469, however what we again are mostly interested in is the Coefficients and our Standardized B values. In the table I am presenting the coefficient matrix where we can see what signes the variables have and also if they are statistically significant with FDI. If we start to look at the WageP coefficient we can see that this variable only has a positive sign of the unstandardized B value when FDI is flowing from an high wage to a low wage country. However we can also see that the coefficient only is significant when we are moving from high wage to another high wage country and from high wage to a low

wage country, meaning that the results we are getting from the low wage countries as home country could likewise be 0. The second thing we are interested to see is the DIST coefficient where we can see that this variable is significant and has a negative sign in all of our sectors, meaning that when the distance is increasing between the home and host country, the flow of FDI will decrease no matter in what sector of countries we are. This result is not surprising and as described in the gravity equation, this is also the expectation. Our other test variables GDP and GDP per capita is not showing any interesting results and is also not significant in all the sectors. The dummy variable showing the common language was automatically excluded from the result as it was not showing any country pairs speaking the same language.

5. Conclusions

As we have discussed, FDI is considered to be an important tool for economic growth in the world economy. As many authors have pointed out there are two main reasons for MNEs engagement in FDI activity distinguished as market seeking for the Horizontal FDI and efficiency seeking for the Vertical FDI, where differences in relative factor endowments is key. However economists are also debating if MNEs are taking advantage of low wages and poor working standards when moving production to low wage countries, as the MNEs are not likely to provide their employees with better working standards then local employees. In the last decade we have seen a great increase of FDI inflows into low wage countries which made me want to analyze if low wages are the key driver to the MNEs localization. In addition to previous literature I am investigating if relative wages have a significant effect on localization of production and this was being done by a general gravity model. As seen in the result we see a positive significant relationship of our coefficient WageP when FDI is flowing from a high wage to a low wage country, while we in the other sectors see either a negative unstandardized B value, or that the WageP isn't significant. This supports the vertical motivation of FDI as the flow of FDI will increase as the wage gap between the countries increases. FDI can be considered to be driven by relative factor costs and MNEs who choose to relocate their production to a country with relatively cheap labor cost, will increase their economies of scale. However we could also see in the result that distance between the home and host country also

plays a role since the larger the distance, the less FDI inflow we will see. This result is not surprising and the gravity model is predicting this in its general form.

The empirical result in this report is based on the theoretical explanations from previous studies of FDI determinants. In order to capture the patterns and determinants of FDI inflows, I produced a OLS and WLS gravity model with all OECD countries together with additional big economies with low wages between the years 2010-2018. At first I did the testing with all the countries, but in order to better understand where wage premium was the strongest determinant, I divided my data into low wage and high wage countries and analyzed the FDI flow between these sectors. Given the result of this exercise, wage premium can be considered a significant determinant to FDI inflow when moving from a high wage to a low wage country. However I want to highlight that MNEs can be hard to classify as strict horizontal or strict vertical since they can be driven by both factor cost and market access. Coming back to my empirical question, FDI can be explained by relatively low labor cost in the sense that the wage premium showed to be a significant determinant of FDI when moving from a high wage country to a low wage country. In neither of the other sectors, the wage premium was as important or significant as we could see going from high wage to low wage countries. My belief however is that when the cost of labor is relatively insignificant (meaning that rates are not varying very much between the countries), the skills of the labor force will be the determining factor of FDI location instead of cost. To summarize, the increased role of FDI in low wage countries has potential to both gain the MNE but also to benefit the local market. A concrete way how local markets can gain from FDI, is through the physical access of the global company, creation of high quality jobs and hopefully that MNE take their social responsibility seriously and offer similar working conditions as they would do in their home country.

References

Blonigen Bruce A., In search of substitution between foregin production and exports. 2001. Journal of International Economics

Blonigen Bruce A., Ronald B. Davies & Keith Head, Estimating the Knowledge- Capital model of the multinational enterprise. 2002

Blonigen & Piger, Determinants of Foregin Direct Investment. 2011

Braconier Henrik, Norbäck Pehr-Johan & Urban Dieter, Reconciling the Evidence on the Knowledge Capital Model. 2003.

Braconier Henrik, Norbäck Pehr-Johan & Urban Dieter, Vertical FDI Revisited*. 2002

Brainard Lael S & Riker David, U.S. multinationals and competition with low wage countries. 1997. NBER Working paper no. 5959

Carr L David, Markusen R James, Maskus E Keith, Estimating the Knowledge-Capital Model of the Multinational Enterprise. 2001. The American Economic Review

Helpman M Elhanan, A simple theory of trade with multinational corporations. 1984. Journal of Political Economy

Markusen R James & Maskus E Keith, Multinational firms: reconciling theory and evidence. 2001

Markusen R James & Maskus E Keith, Discriminating among alternative theories of the multinational enterprise. 1999. NBER, Working paper no. 7164

Markusen R James, Multinational Firms and the Theory of International Trade. 2002

Marr A, Foreign direct investment flows to low-income countries: a review of the evidence. 1997

Norbäck Pehr-Johan, Multinational firms, technology and location. 2001. Journal of International Economics.

OECD, The impact of Foregin Direct Investment on wages and working conditions. 2008

United Nations and World Trade Organization, A practical guide to trade policy analysis. Chapter 3. 2012

Venabels J Anthony, Fragmentation and multinational production. 1999. Economic Review

Data sources:

CEPII, data on Language and Geographical Distance (downloaded 18th of December 2020)

OECD, data on FDI flows by partner country 2010-2018 (downloaded 4th of January 2021)

Ilostat, data on statutory nominal gross monthly minimum wage- Harmonized series (downloaded 6th December 2020)

Ilostat, data on mean nominal monthly earnings of employees by sex and economic activity (local currency) (downloaded 6th of December 2020)

Ilostat, data on manufacturing employment as a proportion of total employment (%) (downloaded 6th of December 2020)

World Bank, GDP per capita (current US dollar) (downloaded 6th of December 2020)

World Bank, GDP (current US dollar) (downloaded 6th of December 2020)

Table 1.

Average monthly salaries	Low skill jobs (average salaries 2010-2019)	High skill jobs (average salaries 2010-2019)	Wage Premium
Russian Federation	€ 564	€ 730	0,77
Estonia	€ 1.059	€ 1.609	0,66
Finland	€ 3.234	€ 3.883	0,83
Sweden	€ 3.332	€ 4.285	0,78
Norway	€ 3.725	€ 5.039	0,74
Denmark	€ 4.580	€ 5.648	0,81
Average	€ 2.749	€ 3.532	0,78

The table uses data provided by the international labour organization Ilostat which is the focal point to the UN regarding labour statistics. The table shows the average salaries between 2010 and 2019 and salaries are split in low skill jobs and high skill jobs. Low skill jobs include salaries within Manufacturing and Construction work and high skill jobs include salaries for Professional scientific and technical activities, financial and insurance activities and information and communication jobs.

Table 2.

	GDP per capita (eur) per country (average 2010-2019)	Gross GDP (eur) per country (average 2010-2019)
Russian Federation	10.140	1.470.326.836.314
Estonia	15.982	21.111.984.033
Finland	39.590	216.077.025.014
Sweden	46.174	451.458.722.839
Denmark	48.830	277.110.838.138
Norway	71.979	369.203.653.585

The table uses data provided by the World Bank and it is showing the average GDP per capita and average GDP Gross by country between the time period 2010-2019.

Table 3.

Employment Rate in manufacturing sector out of total workforce.

	2010	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**Average**
Norway	9,5	9,4	9,3	8,8	8,7	8,6	8,3	8,1	7,7	7,7	8,6
Sweden	12,0	12,0	11,6	11,2	10,7	10,4	10,2	10,1	10,0	10,0	10,8
Denmark	12,7	12,7	12,4	12,1	11,9	12,0	11,9	11,5	11,4	11,0	11,9
Finland	14,8	14,5	14,4	14,3	13,5	13,5	13,4	13,2	13,3	12,8	13,8
Russia	14,9	14,6	14,7	14,5	14,2	14,0	14,0	14,2	14,1	14,3	14,3
Estonia 18,8	19,7	18,8	18,7	18,3	18,8	18,7	19,0	18,6	18,1	18,7	

The table uses data provided by Ilostat and is showing the share of employment rate within the manufacturing sector in a panel data between 2010 and 2019. The data refers to all persons working (paid employment or self-employed).

Table 4.

Descriptive Statistics

Variable	**Mean**	**Standard Deviation**	**Min/Max**	**No of Obs.**
Dep variable:				
FDI Inflows (mln USD)	11.743	41.345	-53.817 / 560.914	10.154
Indep variables:				
GDPi	27,21	1,45	23,3 / 30,6	10.154
GDPj	26,86	1,55	23,3 / 30,6	10.154
GDPCi	10,21	0,91	7,18 / 11,68	10.154
GDPCj	10,32	0,60	9,07 / 11,65	10.154
DIST	7,99	1,17	4,08 / 9,88	10.154
LANG	0,005	0,00	0 / 1	10.154
WAGEP	-0,12	1,06	-3,03 / 3,17	10.154

GDP measured in billion USD & GDPC measured in USD. DIST measured in kilometers. All independent variables are in logs except LANG.

Table 4 Cont.

OLS

Coefficient	Unstandar-dized B	Std Error of Coefficient	t-value	Sig
DISTij	-0,001	-	-5.215	0,000
Lang	24.904.829	1.227.829	20.284	0,000
WageP	26.675	7.804	3.418	0,001

R: 0,575

R Square: 0,331

Adjusted R Square: 0,325

No of Observations: 10.154

WLS

Coefficient	Unstandar-dized B	Std Error of Coefficient	t-value	Sig
DISTij	-6088	146	-41.605	0,000
Lang	1.216.742	251.652	4.835	0,000
WageP	3425	379	9.017	0,000

R: 0,969

R Square: 0,939

Adjusted R Square: 0,939

No of Observations: 10.154

Table 5.

	Low wage to high wage	Low wage to low wage	High wage to low wage	High wage to high wage
n	2618	1512	2291	3733
R	0,551	0,685	0,608	0,643
Rsquare	0,303	0,469	0,369	0,413
		Unstandardized B (SIG)		
Wage P	-9249 (11061)	-6581 (5012)	51240 (15638)*	-32334 (2683)*
DISTij	-1174 (202)*	-597 (193)*	-88725 (5378)*	-17400 (839)*
GDPit	-5249 (5445)	-646 (5590)	65922 (6164)*	8951 (605)*
GDPjt	exc	6715 (6440)	33792 (6013)*	exc
GDPCit	7304 (5450)	1096 (6245)	10230 (19605)	45868 (2765)*
GDPCjt	1985 (1405)	-6783 (6262)	55672 (19129)*	29264 (10010)*

*Coefficient is statistically significant $p < 0,05$

Figure 1.

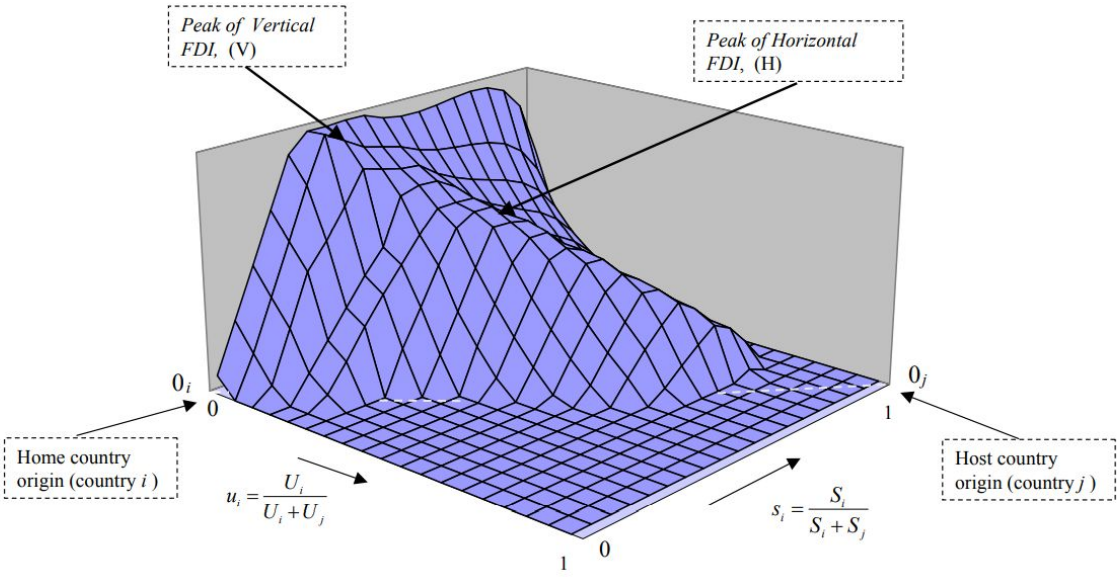

Figure taken from Braconier et al. (2003).

Figure 2.

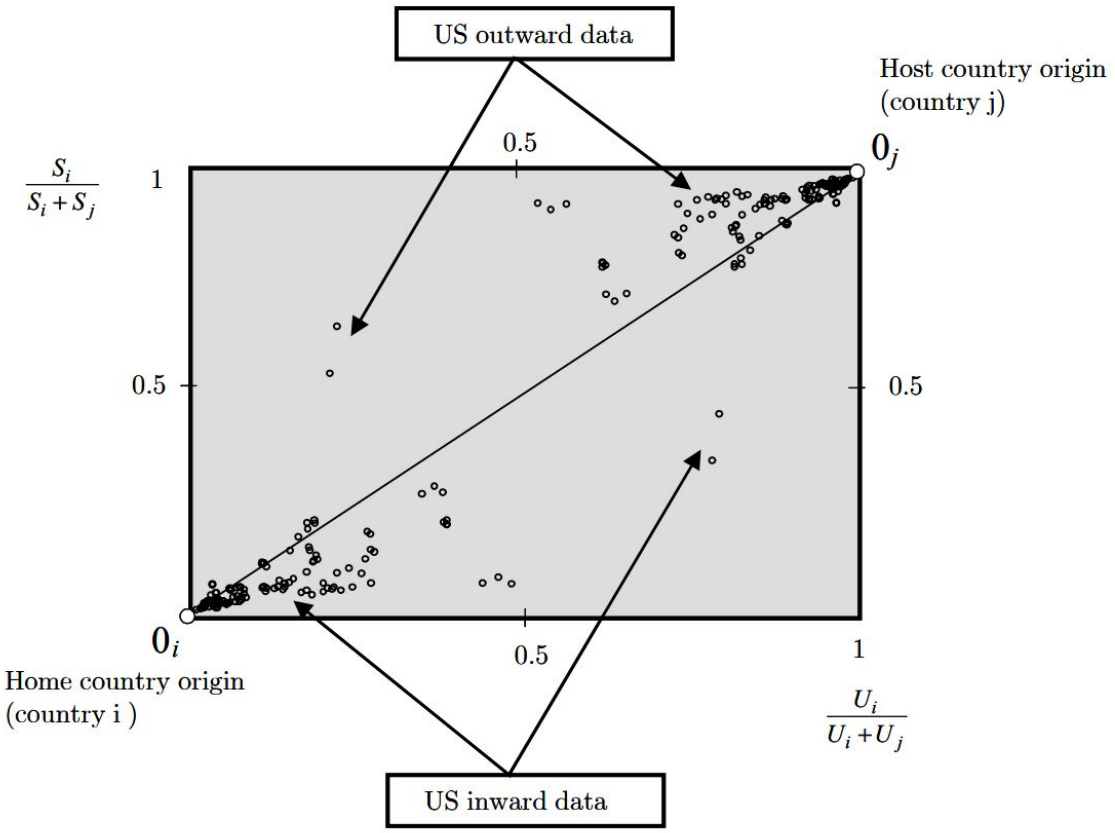

Figure taken by Braconier et al. (2002)