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The production effect of FDI

A comparison between USA and the Nordic countries

Abstract

Foreign direct investment (FDI) is a cross-border investment made by entities from one country to another. The investment is important for both involved parties, contributing to technology, know-how and knowledge. The study aims to investigate whether FDI inflows affect the manufacturing production output in the receiving country, focusing on Sweden, Denmark, Finland and USA. The United States had during the investigated time period a higher FDI inflow value than Sweden, Finland and Denmark and a higher production level. The study also examine if other factors than FDI inflows are important for the production output. In the regression analysis made in the study, it is shown inward FDI into the economies are not significant as a contributing factor to higher production output. The small sample sizes included for FDI and production output, make it difficult in obtaining significant results. The control variables included are seen to be significant for some of the countries, indicating the United States not being very different from the Nordic countries according to its dependence of other factors than FDI to sustain a high production.

Bachelor thesis in Economics, 15 hp
Department of Economics,
Spring 2016
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1. Introduction

Foreign direct investment (hereafter denoted as FDI) has increased over time, but what effect does it have on the receiving country's production? In order to attract investors, the investors need to receive result for their invested money. The main reasons for foreign direct investments are increased efficiency, access to assets not available in the home country (Al-Sadig, 2013) and creating a broader and better market (Nunnenkamp & Spatz, 2004). The knowledge concerning the relationship between production and FDI is of great importance for both the countries and the investors, since both involved parties want to receive as much turnover as possible. One of the factors the economy of a country is dependent on, is its production. How much effect the inward FDI actually have on the production is therefore important knowledge. The production in different countries differs, which may be dependent on several factors such as technology and production environment, but also the amount of capital invested where FDI is a component. Both production and FDI changes over time, to understand whether they are correlated or not, will give an indication of how important FDI is for the production. The different levels of production between countries are also something worth considering, since the differences may affect the investors choice on where to invest.

The purpose with this study is to examine whether foreign direct investments affect the output of manufacturing firms, and whether this differs between USA and the Nordic countries and what the reason for this scenario might be. The Nordic countries (Denmark, Finland and Sweden) with the exception of Norway, have separately been compared with each other and with USA. The reason Norway is not included in the study is due to the few manufacturing FDI inflow observations available for its economy. The data for the countries has been collected from the investigated countries' statistics databases; *Svenska statistiska centralbyrån*, *Bureau of Economic Analysis, Danmarks nationalbank, and Statistics Finland.* In order to discover differences in the amounts of the investments between the countries and over time, time-series data has been used in this study. The data has thereafter been analyzed by using the analysing and statistical software STATA, to determine if there is a significant positive relationship between inward foreign investment and the production output of manufacturing firms. In the regressions, controllable factors have been tested for, to allow

more accurate results of the significance for the variables and also to discuss the possible differences between the countries.

To substantiate our study, information from previously made studies has been collected. These studies are not only important to introduce the background of FDI and its different effects, but to be able to draw accurate conclusions after receiving the results from the regressions. Since no survey or interview have been conducted in the study, meaning no new data has come to light, the study is reliable on secondary data (i.e. already existing data) in answering the research questions.

1.1. Research questions

- *Does FDI in manufacturing firms affect the production output?*
- *Are there differences between the US and the Nordic countries?*

1.2. Thesis layout

The continuous layout of the thesis is the following: after the introduction, a literature review will introduce the reader to the definitions of FDI, its different effects and the background of FDI in the researched countries. Thereafter will the data section explain the information the study is dependent on. The data section will culminate into methodology, where the analysing method will be discussed and explained and then used in time-series analysis where the data will be analysed by using STATA. A discussion will then follow the time-series analysis. The discussion section will analyse the result of the collected data together with the information from the literature review. The thesis will then be reviewed with a limitation section critically criticizing and explaining the limitations of the study and its effect on the results. The study is concluded with the conclusion section and will be based on all the combined findings from the previous sections in the study.

2. Literature review

2.1. FDI – foreign direct investment definition

A foreign direct investment (FDI) is a cross-border investment, made into a company or entity in a foreign economy, by a company or entity in the host economy. There are several ways for the investment to be done; either by acquiring shares in a foreign company, through a merger or joint venture, or either by setting up an affiliated company in the foreign country. At least 10% ownership of the voting stock or ordinary shares of the invested company is required, to be able to obtain a foreign direct investment relationship (Investopedia, 2016). The manufacturing sector has been and remains the most open economic sector, having the lowest FDI restrictions across countries. This indicates that the manufacturing sector in an open economy tends to attract larger amounts of inward foreign investments, than economies highly regulated. Such open economies attracting foreign investors are often characterized with skilled labor forces and good growth prospects (OECD, 2013).

2.2. Why do firms invest abroad?

The most useful and referred classification of FDI is the one suggested by Dunning, John H., that is built upon the OLI paradigm. The OLI paradigm is a theory based on the three factors "ownership advantages", "location advantages" and "internalization advantages", explaining why a firm decides to become a multinational and where it is more likely to invest. This classification of FDI is divided into four categories, declaring about the main motives for firms to shift their production abroad. In particular, foreign direct investments are motivated by investors' desire to avoid trade and transportation costs or by tariff jumping motives (Franco, Rentocchini, & Marzetti, 2008).

The first motive is efficiency-seeking, also called for vertical FDI. It occurs when firms transfer their production facilities, seeking for increased efficiency. Firms choose to transfer their facilities to countries with relatively cheap inputs. The reason this motive is also called for vertical FDI is because efficiency-seeking FDI is viewed as a complement to trade as it

also involves transferring parts of the production chain to the host economy (Al-Sadig, 2013). There are number of signs that indicate that such investments have increased in importance over the last decade. One reason is the trade liberalization that has been going on. It has favored the fragmentation of the production in a multinational company because the costs to transport finished good and inputs have decreased (Herzing, Norbäck, & Persson, 2006). Efficiency-seeking FDI in some parts of manufacturing is based on the relative factor endowment and the local assets of the host economies. A relatively strong growth impact of FDI is expected in industries attracting efficiency-seeking FDI. The reason for this is the increasing probability to bring in technology and knowledge compatible to the host countries' development level. It also allows local suppliers and competitors to gain from spillovers by adapting and imitating other economies (Nunnenkamp & Spatz, 2004).

The second motive in the OLI paradigm is market-seeking, which aims to serve the host country's domestic and neighboring markets. Multinational companies want to have access to other foreign markets with larger sizes, to exploit the possibilities granted by them. This type of FDI in services and parts of manufacturing produces new products and services which benefit the consumers in the host countries. Companies want to satisfy consumers by adapting goods to their tastes (Franco, Rentocchini, & Marzetti, 2008). This is done by making local production and marketing modern and by having a high level of competition in the host countries. This might have a negative effect, since a stronger competition may lead to the crowding out of local competitors, especially if foreign affiliates control higher market power (Nunnenkamp & Spatz, 2004). This motive is also defined as horizontal FDI, as companies choose to make a direct investment in order to produce for the foreign market in a foreign subsidiary (Herzing, Norbäck, & Persson, 2008). The theory for horizontal direct investments is mainly based on the so-called greenfield investments, where new facilities are being used in the host country. In recent years, the increase of direct investments has been done through cross-border purchases. It has been shown in a research that purchase is partly driven by the possibility to a stronger market power. When the number of competitors in the market is reduced, the company can push up its consumer prices. Purchase of companies is also done in order to create synergies, which occur when the combined companies' resources are used more efficiently, for example by a company's trademark taking benefit from the other

company's distribution network (Herzing, Norbäck, & Persson, 2006).

The third motive for shifting production abroad is strategic asset-seeking. It aims to access assets not available in the home country. Those assets cannot be easily transferred to firms in the host country through market transactions, because they are known to be gained through experience and exploited locally where they were created. These assets may be important to the firms' long-run strategy and may help them increase their productivity and take on new activities in the home country by having access to new technologies and knowledge (Al-Sadig, 2013). By having direct access to other firms, the invested company can absorb the assets into their own production processes (Franco, Rentocchini, & Marzetti, 2008). They can also be transferred for free to affiliates located in the host countries, either to circumvent trade barriers or produce with cheap local labor (Al-Sadig, 2013). The last category, resource seeking, is also motivated by investors' interest of acquiring particular types of resources not available in the home country. On the contrary, these resources are for example natural resources or raw materials, but can also be resources offered at a cheaper price such as unskilled labor (Franco, Rentocchini, & Marzetti, 2008).

2.3. Productivity effects of FDI

Direct productivity effects of FDI occur in the companies where the investment is made. These effects of FDI are dependent on measurable structural factors, such as: larger multinational companies that employ more skilled workers, produce more advanced products and are more research and capital intensive. The second dependent factor behind the effect of FDI is specific owned efficiency factors, which are more difficult to measure but include access to effective organizational structure, patent rights and trademarks. This means multinational companies can use a given set of assets more efficient than domestic companies (Herzing, Norbäck, & Persson, 2008). There are many studies from several countries stating a strong positive connection between foreign investments and productivity, measured either as labor productivity or total factor productivity (TFP). This shows only that the presence of multinational companies have a positive effect on an aggregate level. Multi-nationality is in itself a strong contributory cause that foreign companies have a higher productivity than

domestic, because productivity lead for foreign companies against domestic companies disappears almost entirely if we only compare with domestic multinational companies. There is also some evidence that a purchase has a positive effect on the acquired company's productivity, which can be interpreted as foreign takeovers generate synergy effects. Even if the difference in productivity between domestic and multinational companies tend to disappear if one control for differences in measurable characteristics between them, this does not mean that multinational companies are unimportant for a host country. They can bring knowledge and production methods which the host country's domestic companies do not have. When they employ more skilled workers, produce more advanced products, they become more research and capital intensive and the host country's resources can then be used more effectively. In addition, those firms can contribute so the host country's economy becomes more effective, through spillovers. Spillovers, also called for indirect production effects of FDI, are the effects foreign investments have on other companies in the host country. The presence of foreign companies on the domestic market makes it possible for domestic firms to imitate the multinational companies' production or processes. Spillovers do not need to be positive. For example, an increased presence of multinational firms can weaken the competition and the domestic industry may crowd out. Evidence that negative spillovers would occur is weak. The evidence for positive spillovers is not evident, but there is some support the probability for positive effects on the domestic economy is promoted by the technological absorption ability of domestic enterprises, the geographical neighborhood and the extent of vertical links to multinational companies (Herzing, Norbäck, & Persson, 2008).

Studies in recent years have been made to try to catch up possible structural reasons for a higher productivity in multinational companies. These studies were done by estimating cross-sectional regressions on corporate and establishment levels, in which they could verify for factors such as size and capital intensity of the foreign-owned companies or establishments. However, these studies are associated with methodological problems. The production factors included in TFP, capital and labor, suffer often from measurement error. In addition, endogeneity problems could arise. The reason that foreign-owned companies have higher productivity may be that foreign investors buy more productive companies and not as a consequence of domestic establishments that become more productive after a foreign

takeover. Furthermore, the observed results could depend on variables that are correlated with foreign ownership and productivity, but are not included in the corporate characteristics that are used in the regressions. Moreover, today's productivity could depend on previous productivity. These methodological problems have under recent years led to a use of panel data, where these problems are alleviated because companies can be followed over time and the development of similar companies can be compared (Herzing, Norbäck, & Persson, 2008).

2.4 FDI of USA and the Nordic countries

All the Nordic countries and USA began to have a powerful international presence on the global market since the 1990s, caused by their globalization and the liberalization of capital flows (Andersen, Madsen, & Veje Klausen, 2013). USA had its increase somewhat earlier than the Nordic countries, when inflows already expanded in the beginning of 1990, corresponding with high output growth. All countries have had a decrease in the inflow of FDI as a result of the financial and economic crisis in 2008-2009. The crisis had a larger impact on Finland, than the other Nordic countries, but investment flows started to recover in 2010 (Steinbock, 2011). On the contrary to Finland, the favor retention of the Swedish currency against the euro, made it possible for the Swedish economy to survive the financial crisis well (Sullivan, 2014). Denmark on the other hand, experienced a slow recovery after the crisis with a modest increase of FDI which is estimated to heighten in 2016 (Jakobsen, 2015). The economic crisis had a negative effect on the U.S. economy, followed after the decrease of the global recession in December 2007. The value of inward FDI in USA started to intensify again in 2010 with a strong recovery (Kornecki, 2014).

The United States is today the top destination for inward foreign direct investment and is the most productive among the world's economies. Based on empirical research results, there is a positive and significant relationship between FDI and output growth in the U.S (Kornecki, 2014). Sweden however, has the largest market in the Baltic Sea region and is today one of the most globally integrated countries with its competitiveness and productivity. Sweden is together with Denmark ranked as one of the world's most attractive countries to invest in (Jakobsen, 2015), (Sullivan, 2014), while Finland tries to attract as much investment as

possible, with the increased competiveness on the global market (Steinbock, 2011). All of the investigated countries in the study have common advantages with their economies, but compared to the Nordic countries, the main important factor behind the attractiveness of FDI in the United States, is the output growth. This growth in the economy is important to keep attracting foreign direct investment, since FDI has emerged as economies have recognized the value of such an investment (Kornecki, 2014). These investors make the U.S. one of the most flexible and powerful economy in the world. Drawing investments from the most internationally competitive multinationals, the United States becomes stronger by sharing ideas with others. The competitive multinationals bring in global experience, capital, new products, know-how and technology, all of which enrich the economy of the United States (Timmons, Gold, & McNelly, 2012).

The size of USA, its open market, high income levels, quality of infrastructure, technology, research and rule of law and treatment of foreign-owned companies are other important factors attracting foreign investors (Timmons, Gold, & McNelly, 2012). Sweden and Denmark have in likeness with USA an excellent quality of infrastructure and a consistent political stability in their countries. Other main advantages in Denmark in order to attract foreign investors are the high flexibility in the labor market, the business environment and macroeconomic stability (Jakobsen, 2015). Attractive advantages in the Swedish economy in addition to the infrastructure are for example its corruption-free economy, technologies, access to new products, skilled labor force and low levels of corporate tax (Sullivan, 2014). Finland has a very strong industrial base with a high-level science and technology (Steinbock, 2011). Finland is also a very attractive place to invest in with its skilled labor forces, know-how, combustion technologies and effective fuel chains (Niinistö, 2014).
In both USA and Sweden, the manufacturing sector is the industry attracting most foreign investors. In the U.S., the manufacturing industry reached the highest FDI inflows during the period 2000 and 2011, accounting on average for 36% of total FDI flows (Kornecki, 2014). It is an attractive industry with its supplier networks, logistics and legal environment. All of these advantages make it easy to conduct business, explaining why rates of return in the manufacturing sector in USA are high (Timmons, Gold, & McNelly, 2012). In Sweden, the traditional focus has, in similarity to USA, been on manufacturing activities, with large

inward flows into some of its largest automotive and pharmaceuticals companies. The innovative capacity has been one of the Swedish economy's main strength and supports high levels of research and development (Ketels, 2012).

Unlike Denmark, Sweden has to improve its business climate for enterprises, (Sullivan, 2014) and its skilled labor force is threatened by the unimproved education level. Even though Sweden has many competitive advantages, they are threatened by other economies that succeed to provide more advanced markets (Ketels, 2012). The modest increase of flows in Denmark is cause of concern, since it could be seen as foreign investors are skeptical of the investment potential in the Danish economy (Andersen, Madsen, & Veje Klausen, 2013). Other concerns for the Danish economy are from the Euro Area's sovereign debt crisis related to whether Denmark can deal with the decreasing labor supply and the macroeconomics' instability prospects (Jakobsen, 2015). Finland has concerns of its economy diverse from the other countries' difficulties. The country trades mostly with the Baltic Sea Region economies and only 16% with the BRIC economies that actually have high growth prospects. This is viewed as a problem, since FDI and foreign trade are linked. Attitudes toward FDI have changed and a change in the national innovation system is promised, to make it more favorable for FDI. For this to be successful, international knowledge and capital are important. Since 2010, it has also been hard to attract investment because of Nokia's competitive challenges. The increasing globalization is also one problem behind the difficulty to attract investments, since multinationals all around the world has the possibility to invest globally and may favor other countries instead of Finland (Steinbock, 2011). Another weakness in the Finnish economy is the lack of capital for many of its high-tech companies and their limitations for accessing the global markets. (Niinistö, 2014).

Studies conducted on US data show that US multinational companies seem more productive than multinational companies from other countries. The studies conducted on Swedish data, get similar results to those obtained for other countries. For Swedish and foreign-owned companies in industries 1993-2002, there is a positive correlation between foreign ownership and productivity. Even the correlation between Swedish multinational companies as owners and productivity is positive, albeit weaker. These positive productivity effects of multinational

ownership remain but get weaker if industry and other controllable factors are taken into consideration. This indicates on both structural and specific owned factors for the higher productivity. Karpaty (2007) shows that companies that have been bought up by foreign companies, exhibit 8 percent higher TFP after the acquisition than comparable companies that remained in Swedish possession (Herzing, Norbäck, & Persson, 2008).

3. Data

The original data used in this study was denoted in nominal values in the national currency of each country. To enable a comparison over time and between the countries, the data has been computed into real values in Euros. The time period used in the study is between the years 2000 to 2015, for Finland and Denmark the starting year is 2004 and 2005, due to the available data. The Exchange rate used in the calculations is taken from *the European Central Bank (ECB)* the 3rd of May 2016. To create real values, CPI for respectively country has been used with the following equation:

The Swedish data is classified according to the Swedish classification system SNI (*Standard för svensk näringsgrensindelning*). SNI is almost identical with the EU classification system NACE, the only difference being that SNI has an additional level of detail. NACE and SNI are used to classify firms depending on their economical activities to enable comparison and analysis of data both over time and between countries. The use of NACE is compulsory within the EU. (Statistiska centralbyrån, 2016)

During the time period used in the study two different versions of SNI have been used to classify industries in Sweden: SNI 2002 and SNI 2007. They differ in the manufacturing classification (Statistiska centralbyrån), which needs to be taken into account before a comparison between the classifications may be preformed. We have not had access to the differencing data and has therefore not been able to recalculate the older data into the new classification. USA uses the *North American Industry Classification System* (NAICS) to classify different industries from 1997 and forward (Bureau of Economic Analysis). There are

a few classification codes diversifying in their industry appurtenance between NAICS and NACE, but they are still comparable (Eurostat, 2010).

3.1. FDI-data

The first graph (fig. 1) shows the different inward FDI levels of Sweden, Denmark and Finland, between 2000 and 2015, denoted in billion Euros. The second graph (fig. 2) shows the FDI level of USA and the North, the different FDI inflows values between USA and the Nordic countries is very distinct as seen in the graph below. The North is the combined FDI data of Sweden, Denmark and Finland, this to enable comparison with the United States. The original data for all countries can be found in the appendix.

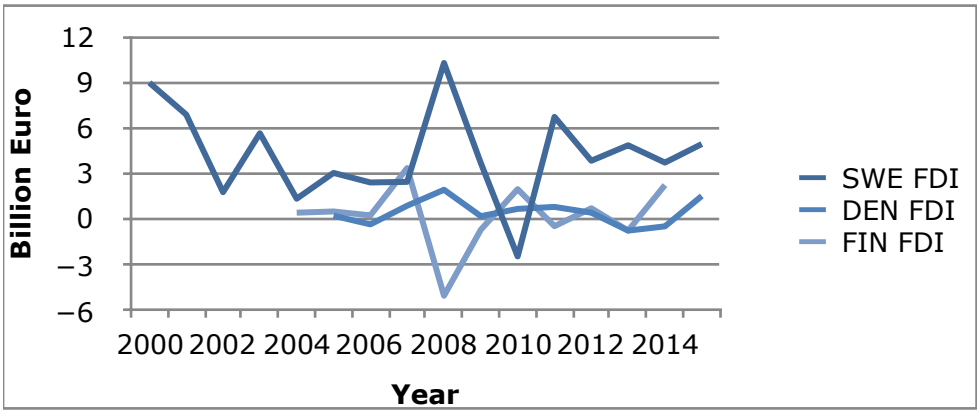

Fig. 1FDI inflows to the Nordic countries

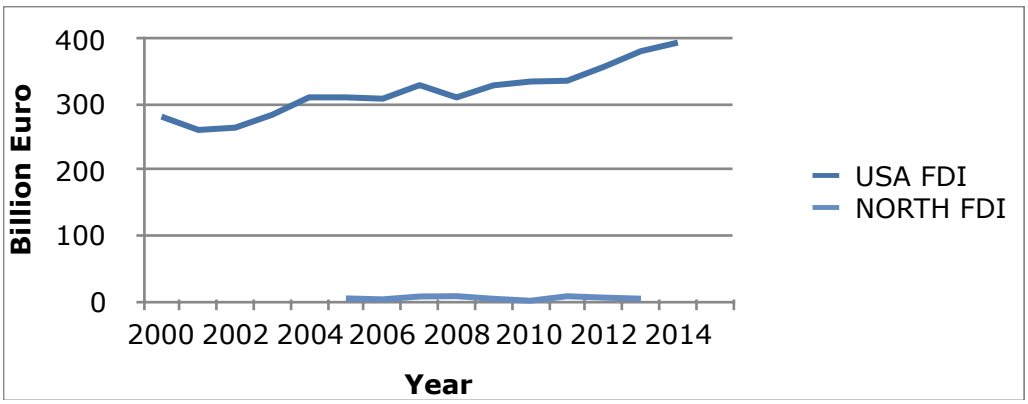

Fig. 2FDI inflows to USA and the Nordic countries

3.2. Output-data

As can be seen in the graphs (fig. 3) and (fig. 4), all the countries follow a similar trend for the production output but at different levels of production, also denoted in billion Euros during the years 2000 to 2014. The original data for the production output can in similarity to the FDI-data be found in the appendix.

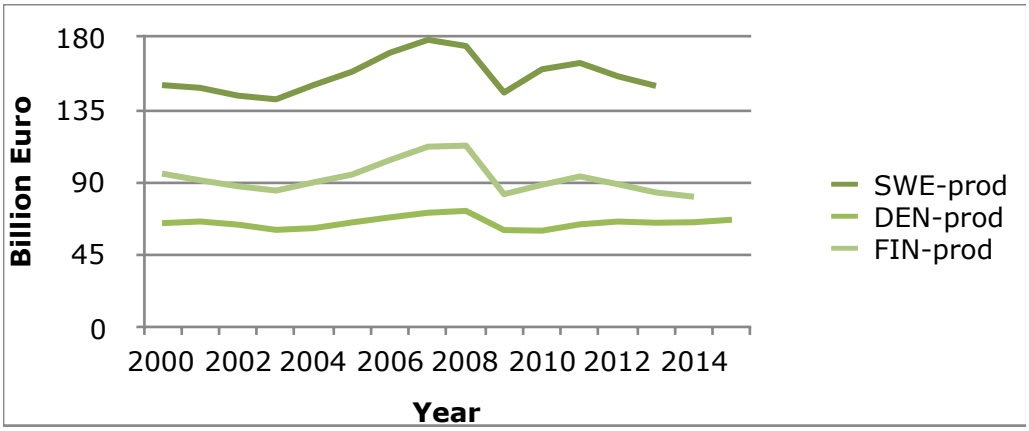

Fig. 3Production in the Nordic countries

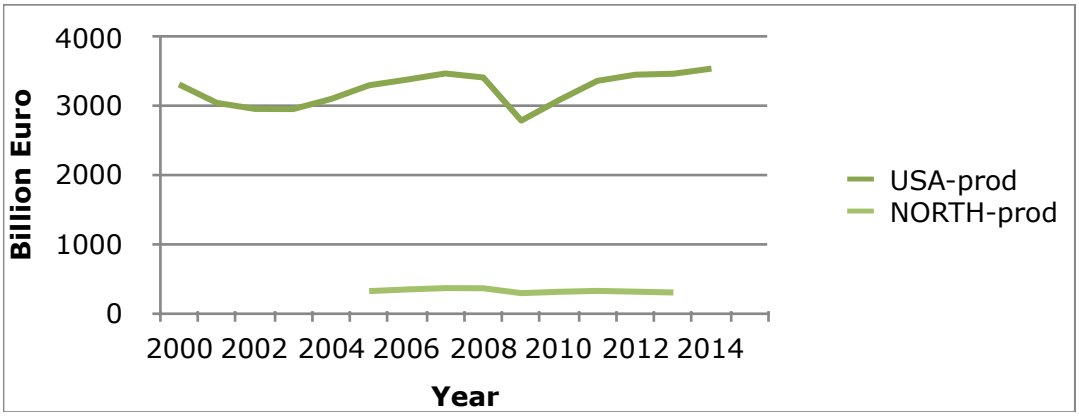

Fig. 4Production in USA and the Nordic countries

4. Methodology

In order to analyse the FDI and production data, the analysis and statistical software STATA has been used. In STATA, a regression analysis has been used to determine whether the FDI inflows are significant for the production output values. To receive a more accurate significance result, three controllable factors have been included and tested for in the

regressions. The chosen control variables are; *Research and development expenditures, Industrial employment, Total amount of researchers.* "Research and development expenditures" is the variable of the amount expenditures spent by business enterprises on research and development. The research and development variable contribute to the total production output, since the amount being spent on research and development are very likely to affect the manufacturing production in a positive way we want to control for this. The second variable "industrial employment" identifies how many employees exist in the industrial sector, regardless of their educational level and experience. If a country has high level of workers in the manufacturing industry (which is very closely related to the industrial sector) a higher production capacity is expected. More workers will be able to produce more goods, the control variable has therefore been added to not have this factor included in the FDI variable. The third variable included is "total researchers", indicating the total amount of researchers available in the country, no matter what they are research intensive in. We believe the total amount of researchers will affect the production output since if there are many researchers the likeliness of finding more production efficient manufacturing methods will increase. These factors may all be of importance, since they all could affect the production growth. The data for these three control variables has been collected from OECD statistics.

A time trend is being included in both the FDI data and production output as years, which can be viewed as an omitted variable. To make sure the OLS estimates are not biased, a time trend as a variable "t" is included in the regression, contributing to detrend the variables. By detrending the variables, the effects of accumulating data sets are removed and only absolute changes in values are taken into consideration. There is also the possibility of past outcomes, i.e. FDI inflows from previous year, affecting the current production outcome. This is viewed as a problem and to separate this scenario from the FDI inflow variable, a lagged FDI inflow variable is being included to the regression.

The regression equation used in the analysis for each country has the following appearance:

The regression in the study has the production output as a dependent variable, the FDI inflow and the controls as independent variables. The aim is to determine if FDI affects the production output in the different countries and if the result differs between Sweden, Denmark, Finland and USA, therefore has a regression been made for each individual country. The regression is based upon a time-series analysis to enable to discover if the invested FDI has had an effect over the years for each country. A positive and significant coefficient (for the FDI variable is expected on account of the appearance of the graphs in the data section and the information from the literature review. The coefficient would then be interpreted as FDI leads to higher production growth. The control variables' coefficients, and are also expected to have a positive coefficient since the research and development capacity and the number of employments are likely to result in a higher production level. According to the literature review is USA more productive and has as seen in the data section higher FDI inflows than the Nordic countries. The coefficient for the USA FDI should therefore be higher than the coefficients for the Nordic countries, indicating investments in USA provide higher production growth than in Sweden, Denmark and Finland.

Variable	*Unit*	*Clarification*
FDI inflow	Million Euros	The amount of FDI invested in the country.
Lagged FDI inflow	Million Euros	The amount of FDI invested from the previous year.
Research and development expenditures	Million Euros	The amount invested in research and development in the country the current year.
Industrial employment	Million employees	The amount of employees in the industrial sector for each country the current year.
Total researchers in the country	Million researchers	The amount of researchers the current year.
Time	One year	The time period

Fig. 5

5. Time series analysis

Dependent Variable:	Swedish production output	Danish production output	Finnish production output	USA production output
Constant	81582,44[i]	-12504,49[i]	-109981,7[i]	-353098,7[i]
	(167012,2)	(27320,12)	(132685)	(2345477)
FDI inflows for respective country	-2,1[i]	3,38[i]	1,16[i]	-5,89[i]
	(1,10)	(1,24)	(0,63)	(3,78)
Lagged FDI inflows for respective country	-2,45**	3,4[i]	2,14**	2,36[i]
	(0,73)	(1,58)	(0,51)	(4,02)
Research and development expenditures	32,12**	-23,77***	4,25[i]	-15,57***
	(9,08)	(5,39)	(6,36)	(6,34)
Industrial employment	-25080,84[i]	69200,17**	180942,3**	85242,1**
	(62724,44)	(11316,61)	(51918,86)	(18538,82)
Total researchers in the country	-820420,8[i]	-850655,4[i]	-2446307[i]	-2221839[i]
	(519122,4)	(943804,1)	(2028225)	(1423609)
Time	-217,67[i]	4375,53[i]	-3185,13**	173438,8***
	(1486,96)	(1553,48)	(365,51)	(68803,63)
Number of observations	12	9	10	12

[i] no sig. *** 10 % sig.level ** 5 % sig.level * 1% sig.level, standard error in parenthesis

Fig. 6

The regressions are constructed with the data denoted in millions, this differs from the data section were the data was denoted in billion Euros. This alteration is conducted due to the size of the control variables' values and to create more comprehensive values.

As seen in the table above the coefficient for the inward FDI is not significant for the production output in the regressions for either one of the countries included in the study. The lagged FDI variable is however significant for Sweden and Finland, but not for Denmark or USA, demonstrating the fact that the inflow of foreign direct investments from previous year is significant for the current manufacturing production output. The Swedish negative coefficient indicates a negative effect from last year's FDI inflows on the production of today. The coefficient being -2.45 indicates a decrease in the manufacturing output with 2.45 million Euros. The Finnish production however, is positively affected by past flows since the coefficient is positive, indicating the lagged FDI is contributing to higher level of production in Finland. An increase with one unit (in this case one million Euros) in FDI inflows from previous year will contribute with a 2.14 million Euro increase in production. This control variable is important, making it possible to measure the effect of previous investments. In this case, it shows if foreign investments have any positive effect on the production output the following year. The variable only captures the effect of FDI one year before, therefore it does not signify if the investments have a positive effect in several years.

The coefficient for the Research and development expenditures indicates if the production output for a manufacturing firm will be dependent on the amount spent in this field by the enterprises. The coefficient is significant for Sweden, Denmark and USA, but not for Finland. Sweden has the only positive coefficient, with a sign of 32.12, meaning one million euro expenditures spent on research and development, increases the production output with 32.12 million Euros. For the United States and Denmark the coefficient is negative, indicating invested capital spent in research and development, will decrease the production output with 15.57 and 23.77 respectively. Industrial employment contains data concerning how large the work force is in enterprises classified as industries. The coefficient demonstrates how the production output is affected by the amount of available employees. The variable is positively significant for all the investigated countries except for Sweden, indicating an increased production output for Denmark, USA and Finland. The total researchers however, indicate by how much the amount of researchers in the country leads to further increase of production, but the coefficient is not significant for either of the investigated countries, indicating the amount of researchers not affecting the production output.

All of the chosen control variables are used to capture if FDI has any effect on the production output. With the coefficients being included and probably significant, will make it more possible to determine if FDI affects the production of manufacturing firms. If the variables are significant, they are dependent factors behind the development and the increase of the production capacity, indicating that foreign direct investments themselves are not the only contributing factor behind the production. It is therefore important to include variables that are important for the output in a company. The research and development capacity in a company contributes to a higher output with its product development and the more research intensive it is, the more likely it is to develop and improve. The number of employees show that the workforce is an important element and the basis of any production. The variables show that even if a company is receiving millions of foreign direct investments, it will not contribute to a high output if there are no employees that can do the actual work, or if it is very low research and development intensive. This differs between the countries investigated. The weakness is that fair differences cannot be drawn from the regressions, since they are based on panel-data on one country at a time.

The time trend included in the regression is solely significant for Finland and the United States. The coefficient for Finland is negative, indicating a production decrease during the time period included in the study, with 3185.13 million Euros for every year. The United States' coefficient is on the contrary to Finland's, positive, interpreted as the production output of the U.S. increases with 173438.8 million Euros for every year. The time variable is likely to identify a cyclical pattern of the different production of the manufacturing companies in the study.

The regressions done in the analysis are based on panel-data, to enable to distinguish the development of the production and FDI over time and to compare it between the U.S. and the Nordic countries. A regression based on one country at a time, shows if the production output of manufacturing firms is dependent on FDI inflows in the country being analyzed. The results presented in the table, for both the dependent and the control variables, show how significant each of the variables is for the country in question. This strategy has some

methodological problems, since it is hard to capture differences between the investigated countries with these regressions, which is the main purpose with the analysis. There is no interaction variables used, that can clarify if there is any significant differences between the variables of these countries. The main advantage with regressions based on panel-data is the evident comparison and development being evolved in the country over time, and how important the control variables included are. There are other methodological problems to be noted in the chosen regression analysis, that are associated with the difficulty of capturing the productivity in manufacturing companies. Production can be correlated with many other factors than FDI, therefore it is not very accurate to believe that FDI increases production by only looking at the development and correlation between these two variables over the years. Secondly, every country has different manufacturing companies with different products and sizes, causing an even harder comparison between them. The theoretical analysis shows that foreign investment can raise productivity partly through increased efficiency or partly through strengthened market power. It would therefore be important to study whether the increased productivity depend on improved efficiency or increased consumer prices, especially in highly concentrated markets. It is also difficult to find "good" comparison option. For example, how would the production of a company change if the foreign investment had not taken place? All these important arguments are not to be measured in these regressions but need to be taken into consideration when studying if FDI increases production.

6. Discussion

In the graphs shown in the data section a distinct relationship between inward foreign direct investment and the production of manufactured goods can be noticed. The graphs for each country follow a similar trend with increases and decreases occurring the same years or the following year. The decrease in 2008 was probably due to the financial and economic crisis, this is also stated in the literature review and the data analysis results confirm this. When creating the regressions in STATA, no significant relationship between FDI and production can be found for the U.S or the Nordic countries. This can be explained by several other factors affecting the output as well as FDI, since a positive correlation between FDI and production can be seen in the time-series graphs.

The result of the countries in the regressions differs, but the significant variables are almost the same for each country. The coefficient for the FDI inflows is not significant for the production output for any of the included countries in the study, but the FDI inflows from previous year is significant for Sweden and Finland. This is very probable since it may take time for the inflows to generate an effect in the output, e.g. the inflow of capital and production increase does not occur simultaneously. The Swedish coefficient is negative, indicating the FDI inflows from the previously year affect the manufacturing output of today negatively. Regarding the negative lagged FDI for Sweden, the FDI inflow from previous year affecting the production output is not very plausible since it is more likely capital invested a year prior will provide a higher production in the following year, not a reduced production. The negative effect may be caused by the lagged FDI not being used in the production part of the manufacturing firms, instead the FDI from previous year might be targeting research and development, access to assets, protecting of patents or another department than production in the manufacturing firms. The reason for not including a lagged variable going further back i.e. capturing FDI investments made several years ago, was due to the limited data available. Such a variable would probably be able to contribute to a more correct effect of invested FDI on the production output. We tried to include a lagged variable going further back in time, but due to the limited data for FDI invested in manufacturing firms, we were not able to obtain a result.

The fact that the FDI inflows are not significant in the regressions, may be the result of the small sample, since it is evidently that both FDI and production output follows the same trend in the graphs. Looking at the graphs a relationship is plainly seen, this is a sign that FDI does have an impact on the value of the manufacturing production. For Sweden, foreign direct investments inflows are low compared to the manufacturing output, even though manufacturing is the main target for FDI directed inward towards Sweden. The low values signify inward FDI as not being the only contributory factor behind the large production value. This scenario corresponds to Finland, which has a manufacturing production approximately 70 times the Finnish FDI inflow value, USA on the contrary has an output

approximately only 11 times the FDI inflow. Compared with the Nordic countries, the difference between the FDI and production is not very large for USA.

There are distinctly other important factors affecting the production in manufacturing firms in USA as well as in the other countries, for example the skilled labour force, technologies and the access to new products. The control variables used in the regressions demonstrate this. Research and development expenditures are significant for all of the investigated countries except from Finland. The coefficient values are negative for Denmark and the U.S, and positive for Sweden. The negative research and development coefficient for Denmark and USA (-23.77 respectively -15.57), is of concern. A decreasing production output due to research and development expenditures is not a credible outcome, since research and development are likely to contribute to more production, which is the result in the Swedish regression. The negative coefficients may be because investments used in this area will lead to more highly developed products, not as easily mass-produced, and the work force may lack the knowledge to be able to produce the goods. The positive effect in Sweden can on the contrary reflect upon the skilled labour available in Sweden and high educational level (which we haven't been able to control for). This can also be supported by the fact that skilled workers produce more advanced products and in turn, the companies become more research and capital intensive, leading to higher production growth. The amount of employees in the industry sector is significant for all countries except for Sweden. The significant and positive coefficients for USA, Denmark and Finland indicate the employees being of high importance for the production output and contribute to an increased manufacturing output. Finland has the highest contribution value to the production per employee, USA is not far behind. The lack of significance for Sweden regarding the employees in the industry sector is concerning. The output is probably dependent of the amount of employees even in Sweden since if there were to be no employees, there would be no production. The amount of researchers available in respective country is of no significance for the manufacturing output for either country. A lagged variable for research and development expenditures would have been able to show how expenditures made from previous years would affect the production output for manufacturing firms, in likeness with other variables we were not able to include this kind of variable due to our few observations of FDI invested in manufacturing firms. For the research

and development variable data from several years were available, but since we were not able to obtain data for more years for the FDI variable, a limitation was created. Expenditures from previous years would probably affect the output.

The amount of researchers in a country and the research and development expenditures are two closely related parameters. If there are a large amount of researcher the likeliness of receiving large funds to research and development will increase. This fact will create difficulty to separate the two in order to see their individual effect on the production output.

The time variable is significant for only Finland and USA, showing a cyclical pattern for each country, describing how the production is regularly occurring in regular intervals. For Finland the coefficient is negative and highly significant. This scenario is expected since Finland has Euro as their national currency and the concerns concerning the Euro during the time period of which this study is dependent on, will then has had a large effect on the Finnish economy. USA has a positive coefficient, indicating a positive cyclical pattern which can also be identified in the graph of the country's production. With a longer time period, a cyclical pattern would probably also have been identified for both Denmark and Sweden.

The Nordic countries Finland and Denmark have the most modest increase in inward foreign direct investment, which is a sign of indication that foreign investors are not very attractive to invest in these economies unlike USA, which has the highest FDI inflows with a steady increase over time. However, this has not a large impact on the production of the manufacturing firms, since the production output is high relative to the inward values of FDI. The large differences in both FDI inflows and manufacturing output between the Nordic countries are of interest, since the countries are rather similar in aspects of infrastructure, economic stability, skilled labours and lack of corruption. The difference indicates something else being of great importance when deciding on where to invest. Sweden seems to be more attractive due to their higher FDI values, this may be due to marketing, reputation and goodwill. Given this information it is very likely other factors influence the manufacturing production, such as technology. The high production in the Finnish manufacturing firms could be supported by the facts about the high-level of technology and science. These factors are

uncontrollable in the study, but are main explanations behind the high production in the firms, despite the low inward foreign investment.

The country to receive most FDI and to have the highest production in manufacturing firms is the United States. In previously conducted studies a significance relationship between FDI and the production output has been stated, but this cannot be supported in this study. The fact that USA has the highest values of FDI inflows and production output indicates a credibly relationship between FDI and production, this is also shown in our tables as well as in other studies. In this study we have found that the amount of employees in the industry and expenditures in research and development are significant factors for the production output in USA. The U.S. is a very large country, considerably larger than the Nordic countries, with the manufacturing sector being the most targeted among investors, which can explain the high values. The Nordic countries have much lower values than USA and will not together add up to the same level as the U.S. The market size of the United States and its size are greatly attractive to investors which contribute to the large investments. The different size of the U.S and the North is an important factor, since it is more likely to receive more FDI inflows if the country is large. A higher variety of firms are more likely to exist in a large country or region than in a small area. Different firms attract different investors, which increase the probability of receiving more funds. The more firms, the more investors will be likely to invest.

The production output might not be the only reason to invest in a specific country. Investors are highly attracted to a country with high technology, skilled labour forces and the production environment. Factors uncontrollable in the study are important forces behind the incentive to invest in the country. Depending on the investors' alignment, this will affect the choice of where to invest. The turnover of the investment is important for the investor but it is also of importance for the country being targeted, since a growing production will result in positive effects on the economy of the country. When foreign multinationals invest, they also contribute with knowledge and technology which can further develop the production of the domestic firms. Therefore, investment in itself is important to enable economies to succeed in developing. Evidence for this is the Finnish innovation system, which needs international knowledge and capital in order to change and develop. It is not only what attract investors that

matter, but also what the motive behind the actual investment is. Multinational companies might want to gain access to assets only available in the host country, produce in a country with lower labour costs or satisfy consumers by getting access to new products. This is another reason for foreign investors that may affect their choice on where to invest. The FDI inflows may result in foreign companies establishing affiliates in the targeted economy, contributing with more job opportunities and increasing the number of employees. The significance of these aspects indicates that FDI is important for a country's production output even though this is not shown in the regressions in this study.

All variables affecting production output in manufacturing firms have not been included in our regressions. Variables such as knowledge, available technology, "ordinary workers" (i.e. those who actually make the products), working experience etc have not been included. These are just a few examples of variables which may affect the production output. Some of these variables are hard to measure (e.g. knowledge) which have not made it possible for us to include them in our regressions and for some have we not been able to find data. This is the reason for our rather few control variables, but we believe the included control variables also are of importance for the production output for a manufacturing firm.

7. Limitations

Secondary data has been used in the study that may affect the results since the data was not originally collected for the exact same purpose. The data has been recalculated to enable clear and comparable values. This might have led to miscalculation and depending on the exchange rate used in this study, the result might differ if another exchange rate were to be used. The data collected has originally been compiled very similar in the different countries, due to the fact that the industry classification in Sweden, Denmark, Finland, and USA are similar, but there are minor differences. We have not been able to take these diversities into account since we have not had access to the diversifying data. The fact that we chose to compare the data without taking this into account may have affected the outcome of the results. The samples used in the study are rather small for each country. If larger samples were to be used the results may differ, making it easier in obtaining significant results. A larger sample would also have enable us to use more lagged variables, and using lagged variables going further back in

time, i.e a four years lag instead of only a one year lag.

There are only three control variables (the time and lagged FDI variables excluded) in the regressions, which is also seen as one of the biggest limitations in the study. There are also some limitations in these variables that may have given different outcome. None of the variables are only representative of manufacturing firms, but for the country as a whole. Since the study is based on manufacturing companies, this limitation has an effect on the results. The expenditures of business enterprises on research and development and the number of researchers in a country are important factors behind the growth of a company. They explain whether a country is development intensive or not, but it does not specify how much of the expenditures are being invested in manufacturing firms. The labour force is an important factor for the production growth, since higher numbers of employees provide more output. The biggest limitation in this variable is that there is no data on how skilled the labour force is, therefore the main importance of the employees is not being analysed. Unlike the other two variables, the data included for the variable "labour" is for industrial companies, which is close to manufacturing companies.

The reason why more variables are not included is due to the lack of data we were able to obtain. Factors affecting the production are for example; technology, production environment, access to skilled labour and raw materials. These factors are not taken into consideration in the study and might have affected the results since all of these will be included in the error term in our regressions. If these factors had been controlled for, the coefficient for the FDI inflow might have been significant in the regression analysis. Even if these factors were controlled for, there is no certainty that the production output would be positively significant of the inward foreign investment.

The study is mainly focused on manufacturing companies, but the main targeted industry for foreign investments inflows towards the individual countries is not focused on the same industry. As seen in the literature review, only USA and Sweden has manufacturing as the most important sector for foreign direct investments. This diversity in targeted industries might have led to an unequal comparability in the results, since other sectors in Finland and

Denmark are of more importance to foreign investors, which may be explaining the low investment values.

Ideally a regression comparing across all countries over time on the dependent control variables would have been preferable to the separate regressions made in this study. A combined regression would enable a more distinctive differentiation between the countries and enable to discover whether the countries themselves are of importance for the production output. This would also have allowed more accurate comparisons between the FDI variables, since an interaction term with both the country in question and corresponding FDI inflows would have been added to the regression. The possibility to discover if the FDI inflows are dependent on which country is being targeted and how much higher or lower the investments are compared to USA would have been possible to decipher. Due to the lack of available observations in the collected data, combining all countries into one regression is not possible, since the ability to deduce significant and comprehensible results would be difficult. The ability to deduce significant results has been difficult even when the countries have been analysed individually due to the few observations, to combine them would have proven even more difficult to decipher the outcome.

8. Conclusion

Foreign direct investment is an important factor for the production growth in the manufacturing companies and it also contributes to new technology, know-how and knowledge that can be of use to the domestic market. All countries are not dependent of inward foreign direct investment, as seen in the regressions, the FDI is not significant for the production output of manufacturing companies. This is explained by other factors being of importance for the growth of production and also by the lack of data, small sample sizes and non-controllable factors in the analysis. Number of employees in the industrial sector is to be seen an important factor in the analysis, showing that countries are dependent on the amount of their labour, except for Sweden that is instead characterized by its educated and skilled labour force. Some of the coefficients values from the regressions are not sensible, both

significant and non significant coefficients. The values and signs for the non significant coefficients are strange, but since they are not significant in the study, an interpretation is not plausible for these coefficient values. A country's labour force, technology, research and development capacity and knowledge are example of factors that a company needs to be able to have a high production. Overall, what attract investors the most is the economy's size, political and economical stability, the quality on infrastructure and development.

When countries are globally engaged, global crises will affect their economies as well. The economic and financial crisis in 2008 is an evidence for this, as it affected both investments and production of the countries' manufacturing companies. The effect of the economic and financial crisis is evident in both the graphs and the time-series analysis. In the graphs the effect can be seen as severe decreases, for both FDI and production.

The main and most important conclusion in this study, according to the research question, is that it is not accurate to say USA is more productive than the Nordic countries. Comparing productivity with only the inflow of foreign investments, USA doesn't have the highest turnover. The productivity is around 11 times higher than inward investment, while looking at Finland for example, we can see an almost 70 times higher productivity. A conclusion whether USA is more productive because of FDI, is therefore not to be concluded. Overall, looking at the value of the production, the United States has a much higher production output than the Nordic countries in the study. This high output, is the main attractive reason for investors, explaining the high inflow of inward FDI, compared to the Nordic countries that are more dependent on improving the economy's quality in order to attract investors.

The effect of foreign direct investment inflows in the countries included in this study does not affect the production output of manufacturing firms according to the regressions. The first research question: *Does FDI in manufacturing firms affect the production output?* cannot be attested, since no evidence confirming FDI affecting the output can be interpreted (except for the lagged FDI which is significant for Sweden and Finland, but not for USA and Denmark). The only relationship indicating an existing relationship between FDI and the production output of manufacturing firms can be interpreted from the graphs. According to the question

"*are there differences between the US and the Nordic countries?",* both similarities and differences can be concluded from the study. Looking at the regression analysis, some controllable variables were significant for both USA and other Nordic countries, as for example industrial employment. Controls not significant for USA, as for example the lagged dependent variable, were significant for Sweden and Finland. According to the regressions there are some methodological problems and due to this it is difficult to define any differences between the investigated countries. The most noticed difference between USA and the Nordic countries is the FDI inflows and production output of their manufacturing companies.

9. Appendix

9.1. Original Tables

9.1.1. Sweden FDI

The numbers are in million SEK.

Foreign direct investment in Sweden, net, million SEK by industrial classification SNI 2002 and year

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
TOT total	157956	505124	214697	112735	119504	43632	89768	86879	203138	194961
01+02+05 agriculture and fishing	33	..	..	7	..	0	0	..	0	0
10-11+13-14 mining and quarrying	-15	..	..	..	..	..	..	7126	..	..
15-19+2-3 manufacturing	32099	430709	84203	66139	17414	56592	13505	30712	24739	25636
15+16 food product, beverage and tobacco industry	..	11486	..	10468	519	-967	-10805	..	6196	-11095
17-18 textil and wearing apparel	..	..	..	..	21	0	0	..	..	..
19+26-27+31+36-37 other manufacturing	8914	32460	21924	..	-13578	-3625	5219	-10757	-6356	13435
20-22 wood, publishing and printing	7098	2787	..	26844	-4359	31916	-15233	12732	8718	14640
23-25 petroleum, chemicals, rubber and plastic products	..	..	17184	..	10033	14784	36789	7153	..	23190
28-29 metal and mechanical products	2577	2928	18543	4879	1581	4806	-937	..	..	..
34-35 vehicles and other transport equipment	5519	..	10087	14004	14257	-7497	-3187	7543	5863	..
40+41 electricity, gas and water works	-689	3739	18766	..	27877	1146	-12038	-2561	28419	15116
45 construction industry	93	421	480	456	..	..	..	..	-5810	..
50-52 wholesale and retail trade; repair shops for motor vehicles, personal and houshold goods	-1413	-5646	36973	-9193	1001	6336	-1312	-8155	-704	35947
55 hotels and restaurants	..	..	..	..	139	..	..	..	..	..
60-63 transport, storage and warehousing companies; travel agencies, cargo handling companies	3131	8949	1330	4592	..	..	..	-4807	3976	1034
60-64 transport, storage and communication	3856	11162	4078	6918	29092	10148	-7435	-3255	16666	2367
64 post and telecommunications companies	725	2213	2747	2326	..	..	..	1552	12691	1333
65-67+74.150 financial intermediation	-2008	11563	19135	15235	20645	23763	35633	11960	86938	30286
65+74.15 financial intermediation, except insurance pension funding	..	..	..	13182	..	24706	..	..	..	..
66 insurance companies	..	..	..	31	..	..	..	..	..	..
67 service companies auxiliary to financial intermediation	..	..	..	2022	..	-1235	..	..	..	..
70.110+70.2-70.3mfl real estate renting and business activities	98500	14866	3461	24377	22460	-50469	22375	-5453	28280	29914
70.110+70.2-70.3 real estate activities	97210	7949	380	12728	9563	-53020	..	959	5935	..
70.120 companies for buying and selling own real estate	-180	10	-187	..	869	1827	2149	4214	1926	7039
72 data consultancy and data service companies	..	6662	-3091	-1281	..	..	12579	5096	22410	..
73 institutes for research and development	..	17	1045	3647	..	..	..	123	240	..
74.11+74.12-74.14mfl other business activities	..	247	4743	9259	..	..	..	-11596	-884	-1166
75+80+85+90-93 other services	759	504	728	379	3155	..	..	2473	..	..
AVM reinvested earnings	19798	32791	28756	-5558	-1066	7150	36621	41913	20004	52563
EJBR not allocated	7123	5005	18304	13975	-2082	-12861	270	7905	2680	-3907

Source: SCB

Foreign direct investment in Sweden, net, million SEK by industrial classification NACE Rev. 2 and year	2008	2009	2010	2011	2012	2013	2014	2015
TOT total	236771	65190	-27912	77100	102131	31645	24432	106105
01-03 agriculture, forestry and fishing	0	0	0	0	0	-33	-143	-143
05-09 mines and quarries	..	..	0	0	..	-5947	-1285	-5096
10-33 manufacturing	111053	39847	-26704	75385	43489	54964	42042	55738
10-12 food product, beverage and tobacco industry	53826	..	-193	16605	1346	16005	-20404	2471
13-14 metal ore mines and other mines and quarries	..	..	0	0	0	..	..	17
15+23+27+31-33 other manufacturing	-4989	6625	-1495	10553	5392	-9154	1069	..
16-18 wood, publishing and printing	..	..	9676	..	..	-3962	414	-1141
19-22 petroleum, chemicals, rubber and plastic products	-5752	4356	615	-17692	5846	-14210	-160	22897
24-26+28 metal and mechanical products	18822	2614	1817	6850	-14411	23580	-9781	5966
29-30 industry for transport equipment	14236	..	-2280	..	..	..	..	..
35-39 energy and recycling	79798	-1766	4978	-25835	-105	3087	-18186	-32101
41-43 construction	..	..	..	..	..	-563	-1408	-764
45-47 wholesale and retail trade; repair of motor vehicles and motorcycles	6718	16105	-6670	24132	10071	-18774	20907	16826
49-53 transport and storage	3099	6683	3892	1754	2199	-303	-1891	-440
49-52 transport and storage excl. Postal and courier activities	3099	..	3892	1754	2199	-272	-1432	-225
53 postal and courier companies	0	..	0	0	0	-31	-459	-215
55-56 hotels and restaurants	..	..	..	..	..	2412	1007	626
58-63 information and communication	-5668	-6116	2838	13713	-3718	-6020	26120	13694
64-66 financial and insurance activities	5600	4633	4853	-36209	-23855	21998	-40711	9933
64 banks and other financial institutions	-3837	13611	6770	9031	3989	23153	-40428	8471
65 insurance and reinsurance companies, pension funds	-5453	4078	..	..	-23213	-171	-1025	360
66 service companies auxiliary to financial intermediation and insurance, reinsurance and pension funding	14891	-13056	..	..	-4631	-984	743	1102
68.1 companies for buying and selling own real estate	4938	2677	2638	3452	1407	2280	2307	2606
68.2-68.3 real estate activities excl. private real estate	3475	3236	-3739	-2463	8512	-1058	-3345	36
69-75+77-82 legal, professional, scientific and technical activities	24386	-434	6159	19464	62033	6710	-15225	27601
84+97-99 other services	0	0	0	0	0	206	0	..
85-88 education, human health and social work	..	..	..	..	..	-931	-2369	..
90-96 arts, entertainment, recreation and other services	0	0	0	0	0	-218	1642	341
ÅVM reinvestment of earnings	..	..	..	..	..	..	..	..
EJBR not allocated	3372	325	-16157	3707	2098	-26165	14970	17248

Source: SCB

9.1.2. USA FDI

Only data included in "manufacturing" has been put in this appendix due to the size of the original table, which include all industries.

Balance of Payments and Direct Investment Position Data (May 4 2016 2:44:03:533PM)

U.S. Direct Investment Abroad,U.S. Direct Investment Position Abroad on a Historical-Cost Basis

Bureau of Economic Analysis

By Industry of Affiliate Only (All Industries) (NAICS) (Millions of Dollars)

	All Countries Total															
	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Manufacturing	327282	343899	328030	337741	371078	416643	430737	441724	484839	474733	501122	518321	536656	582583	630505	662640
Food	23268	23497	21334	19236	27692	28220	27638	31215	40588	40317	42780	47704	52388	56580	64638	65702
Beverages and tobacco products	15660	14238	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
Textiles, apparel, and leather products	3969	3894	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
Wood products	3278	3168	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
Paper	12479	13211	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
Printing and related support activities	2112	2181	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
Petroleum and coal products	13886	13654	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
Chemicals	81727	75807	79186	82543	91435	101794	106975	94519	95915	110311	113507	111327	127350	131626	136554	147623
Plastics and rubber products	10542	10607	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
Nonmetallic mineral products	6370	6576	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
Primary and fabricated metals	21569	21644	21814	20790	21349	24917	23013	18773	22244	18207	18728	18674	20818	25142	26784	26725
Fabricated metal products	11748	11438	10747	10000	9175	11045	11508	13953	13890	10602	11720	11107	12097	12014	12923	14006
Machinery	21501	22229	17655	18349	20825	21613	26433	29136	31257	36110	39805	41285	46224	51925	50673	52916
Computers and electronic products	46783	59909	58651	49580	47171	53084	50773	63113	69467	67859	71811	72935	75170	84125	88712	99149
Electrical equipment, appliances, and components	8212	10005	9552	9763	10774	13905	15449	16293	19979	21819	18850	19941	9404	11261	12990	12785
Transportation equipment	43322	49887	40487	45320	47903	53156	50739	50663	60612	44541	51062	49636	46091	43857	53162	56035
Furniture and related products	1028	1051	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
Miscellaneous manufacturing	11574	12341	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.

Source: BEA

9.1.3. Finland FDI

Foreign direct investments by industry 2004-2012 by Direction of investment, Activity, Data and Year													
			2004	2005	2006	2007	2008	2009	2010	2011	2012		
Inward	Manufacturing	Flow	477	574	281	3867	-6021	-834	2444	-589	950		

Source: Statistics Finland

Foreign direct investments by industry by Direction of investment, Activity, Data and Year				
			2013	2014
Inward	Manufacturing	Flow	-1007	3062

Source: Statistics Finland

9.1.4. Denmark FDI

Quarterly flow statistics on direct investment by domestic economic activity, item, principle, type and time																		
Units: DKK billion																		
			2005Q1	2005Q2	2005Q3	2005Q4	2006Q1	2006Q2	2006Q3	2006Q4	2007Q1	2007Q2	2007Q3	2007Q4	2008Q1	2008Q2	2008Q3	2008Q4
1200: Manufacturing	1: Direct investments	Inwards	2	2	2	-4	0	-2	-1	0	2	3	2	2	1	1	16	0
			2009Q1	2009Q2	2009Q3	2009Q4	2010Q1	2010Q2	2010Q3	2010Q4	2011Q1	2011Q2	2011Q3	2011Q4	2012Q1	2012Q2	2012Q3	2012Q4
		Inwards	1,3	0,1	-0,3	0,8	3,9	1,5	0,7	0,4	2,4	4,4	-0,1	1,3	-2,1	5,9	-0,7	1,2
			2013Q1	2013Q2	2013Q3	2013Q4	2014Q1	2014Q2	2014Q3	2014Q4	2015Q1	2015Q2	2015Q3	2015Q4				
		Inwards	-1	0,8	-7,1	-0,3	-3,6	-1,7	-0,7	1,2	-0,1	11,9	2,5	1,4				

Source: Danmarks nationalbank

9.1.5. Sweden production

Output, intermediate consumption and value added (ESA2010), current prices, SEK million by industrial classification NACE Rev. 2, transaction item and year

		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
C10-C33 manufacturing industry	output at basic prices	1182981	1252651	1406832	1424738	1407920	1412473	1498243	1596251	1738554	1860340	1883112	1566764	1744471	1833340	1756508	1688472
C10-C12 manufacture of food products, bevera	output at basic prices	116949	117884	118982	124623	126404	124129	125987	128189	134344	134954	146602	145782	145470	151449	153519	156532
C13-C15 manufacturing of textiles, clothing an	output at basic prices	13001	12730	13432	13852	13983	13577	13210	12737	12809	13405	12493	10869	11236	10976	10454	10674
C16 manufacture of wood and of products of	output at basic prices	55018	56741	61758	63416	65524	68623	70123	77476	83769	95538	86390	77193	85757	85255	78930	75402
C17 manufacture of paper and paper products	output at basic prices	94298	96587	116427	116119	113734	114109	113967	115663	122427	125160	127061	119550	130146	131933	125830	121811
C18 printing and reproduction of recorded me	output at basic prices	26359	26147	27487	26829	26762	25384	26437	25992	26124	26783	27815	25058	24688	23833	22566	20475
C19 manufacture of coke and refined petroleu	output at basic prices	24708	27931	48493	46021	40729	41629	49623	65617	79593	75579	107141	82611	100386	113759	131798	107821
C20-C21 coke, refined petroleum, chemicals ar	output at basic prices	96487	103567	112600	122806	132855	131958	133717	142351	154706	155664	153076	164197	162815	160396	156489	149646
C22 manufacture of rubber and plastic product	output at basic prices	31955	32687	33774	34113	34192	36074	35837	37240	40580	43053	41935	36720	41452	43956	41361	40579
C23 manufacture of other non-metallic minera	output at basic prices	19969	20754	23101	25052	25666	24672	25670	28131	31544	35544	38485	32844	38400	43643	44018	42451
C24 manufacture of basic metals	output at basic prices	73549	73726	87069	85735	90361	90312	109975	125172	149122	169645	161289	104096	145241	156604	136455	122746
C25 manufacture of fabricated metal products	output at basic prices	82744	83406	91901	91598	90517	90009	97515	105765	115315	130650	135856	106790	117066	124351	126530	123390
C26 manufacture of computer, electronic and	output at basic prices	150572	180510	201657	180135	147341	127038	144086	145864	159306	163610	170112	156835	167147	144429	135884	140495
C27 manufacture of electrical equipment	output at basic prices	40563	41196	50209	58056	54087	53125	52527	54531	59144	64658	66704	59507	59905	63344	62010	62976
C28 manufacture of machinery and equipmen	output at basic prices	116083	118096	127465	140345	145831	147370	153715	171878	191945	214330	217365	153409	178253	207731	201351	177558
C29 manufacture of motor vehicles, trailers ar	output at basic prices	160438	179806	203085	199404	201258	223063	244480	253323	264570	288318	264931	166372	213859	250277	214622	222835
C30 manufacture of other transport equipmer	output at basic prices	24098	23389	25395	27567	28131	29255	28220	30606	32607	35056	36413	38432	37924	37554	37095	40348
C31-C32 manufacture of furniture and other m	output at basic prices	36164	37036	41901	44850	45322	46082	47584	47891	50743	55764	55081	52753	53276	54179	51162	46935
C33 repair and installation of machinery and e	output at basic prices	20026	20458	22096	24217	25223	26064	25570	27825	29906	32629	34363	33746	31450	29671	26434	25798

Source: SCB

9.1.6. USA production

The U.S tables are large and complicated to incorporate in an appendix, since they would take up several pages. The data is divided into several tables (one for each year) containing all different types of manufacturing firms and their values. The original data is available at: *http://www.bea.gov/iTable/itable.cfm?reqid=52&step=1#reqid=52&step=102&isuri=1&5206=3&5205=sec&5209=2014&5215=31gsectot&5216=22def&5210=*

9.1.7. Finland production

Production and generation of income accounts by Industry, Sector, Transaction, Information and Year													
				1998	1999	2000	2001	2002	2003	2004	2005	
C Manufacturing	S1 Total economy	P1R Output at basic prices	Current prices	80282	84103	99397	97626	95518	93804	99644	105764	
				2006	2007	2008	2009	2010	2011	2012	2013	2014
				117312	128660	134491	101838	108998	119260	116633	112391	110138

Source: Statistics Finland

9.1.8. Denmark production

1-2.1.1 Productionand generation of income (10a3-grouping) by price unit, industry, transaction and time												
Units: DKK million												
			1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Current price	C Manufacturin	P.1 Output	443082	449747	459466	506516	526822	523426	507534	522255	562283	600680
			2007	2008	2009	2010	2011	2012	2013	2014	2015	
			636940	669453	565809	575467	630355	662952	660765	667922	686644	

Source: Danmarks nationalbank

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