Why do only some firms participate in International Trade?

What differentiate firms who export and/or do FDI from firms that do not?

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Preface

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Abstract

The global economy has seen the rise of large Multinational Enterprises that holds large shares of aggregate markets. With a more globalized world, these MNEs integrate useful links into their value chain to achieve larger revenue and makes the competition for smaller firms too difficult to participate in international trade. With new trade theory it is shown that scale economies are the drive behind trade, but every firm has the production efficiency to compete in foreign markets. In this thesis I will look at what differentiates firms that export and/or do FDI from firms that do not. The central result is firm heterogeneity, where the least productive firms cannot justify an investment to enter international trade.

Contents

List of figures and tables

1.1 Introduction

This thesis will be a review of new and classical theories of international trade. Thanks to the large amount of research done on the area, the topic has been in constant development to explain the drivers behind international trade.

Throughout the years there has been developed several theories that explain why international trade is beneficial for consumers and how countries and firms best can serve their demand. In this review I will go through the most influential theories of international trade where I start off with the classical theory and continue with new trade theory which is more modernized and gives a better understanding of why not every firm is capable to sell their products in foreign markets.

In today's global economy we have seen the growth of firms that have established themselves as "global firms". A global firm is a multinational enterprise and have large market shares over the world. They tend to produce their products in different countries, termed multinational production (MP). By doing so, these firms can choose where to locate their plants and select export destinations based on the location of the plant (Bernard, 2018). The possibility for growth for these MNEs has come through trade liberalization, the evolvement of technology and the firm's own research and development which makes them more efficient in the production of goods compared to their competitors. I shall present arguments and empirical evidence that is meant to give a better understanding to why some firms shy away from exporting, and foreign direct investment (FDI) through greenfield (GF) and Mergers & Acquisitions (M&A).

First, I start off with presenting what separates classical theory from new theory and give an overview of the development in the theory and findings that are based of off monopolistic competition models.
Further I will give a deeper explanation of classical theory, Ricardian trade theory and Heckscher-Ohlin models in part 2, before I start part 3 which contains monopolistic competition, firm heterogeneity, forms of market penetration, and issues that may occur when a firm has operations in a foreign country. The last part will present evidence from Bernard 2018, who find good proof that some firms compete on far better conditions than other firms.

1.2 Earlier research

Until the late 1970s international trade models often had the assumption of - and were based on perfect competition. This suggests that all firms are selling identical (or perfect substitutes) products in a market where they compete on the same terms independent of firm size and their market shares. Firms are unable to determine prices, there are no exit or entry barriers, and consumers and competitors have full information about each other.
Krugman (1978) introduced the thought that scale economies evolve from the firm's internal attributes and not given externally, which was the prior assumption. Within classical models, trade between countries developed from differences in factor endowments (Heckscher and Ohlin) or technology within the country (Ricardo). Krugman asserted that trade has no need of only existing because of differences in factor endowments and technology between countries, but trade is the expansion into new markets by exploiting scale economies (Krugman 1978).

It was exiting work when Krugman implemented scale economies into trade models. Until then the norm of analysing trade between countries was through models originating from David Ricardo, and Eli Heckscher and Bertil Ohlin's models. This framework says that trade between countries happened because of the country's scarce and abundant resources – comparative advantage. In these models, economies of scale were achieved externally.

Krugman's work has been important in the research of international trade and developing the trend of firms operating under monopolistic competition.

Empirical patterns in the late 90s and early 2000s showed that the most productive firms enter export markets, and there is a reallocation of market shares and resources to these firms. This self-selection of firms into export markets and reallocation of shares contributes to productivity growth within sectors/industries. (Melitz, 2003)
The work of Melitz (2003) is today highly relevant in the research of international trade patterns, in which he has combined monopolistic competition with increasing returns to scale and firm heterogeneity in his model.
Firm heterogeneity is the differences in firms' productivity, and their level of productivity decide whether the firm enter the export market, only sell to the domestic market or exit (Melitz 2003).

He explains how a closed country opening to trade increase the competition for the already existing firms and how trade liberalization reallocates market shares and resources to the most

productive firms, thus making the firms self-sort into one of the three mentioned options (export, domestic or exit). Because of the entry free to becoming an exporter, only the most productive firms within the sector choose to enter the export market. These firms benefit from trade liberalization by gaining markets shares in new countries and then increasing their profits (Melitz 2003).

For a firm to change from a domestic seller to an exporter there is need for investment. The cost of entering the export market is of such size that some firms decide to stay out, and even exit. This will later be explained more thoroughly. The investment to become an exporter is viewed as a sunk-cost, and firms must compare their profits now and efficiency in production with future profits. This is also confirmed in later studies (Bernard. AB & Jensen. JB (2004) & Sanghamrita et al., (2007)), though the evidence from Bernard & Jensen does not clarify if productive firms become exporters or if exporters become more productive.

Something Melitz (2003) does not mention, is how firms position themselves regarding their location of plant or affiliate. His focus of market penetration is only limited to export and leaves out other forms of penetration, such as Foreign Direct Investment.

FDI to enter new markets generally comes in two forms, greenfield investment or through mergers & acquisitions.
Helpman, Melitz and Yeaple (2004) build further on the assumption (or fact) that only the most productive firms export, by adding horizontal FDI into the research. They find the same evidence, that only the most productive firms engage in cross-border activities. In addition to confirming Melitz's (2003) observation, they also show that firms engaging in horizontal FDI are even more productive than pure exporters (Helpman et al., 2004).

Horizontal FDI is the replication of plants or affiliates to promote sales in new/other markets and can substitute export if the possible profits by operating a plant in the target location is larger. The decision to conduct FDI also rely on the trade-off between proximity and concentration. It is desirable to horizontally expand if the costs of transportation, tariffs and other costs connected with export are high. This is known as the proximity-concentration trade-off, which Brainard introduced in 1993.
There are other forms of cross-borders operations that could be view as FDI, but these forms are generally done to vertically integrate different levels in the production chain i.e., to make the production cheaper. For now, I'll keep the focus on the horizontal forms of investment,

and its role in the picture of international trade.

GF and M&A play off the firm's internal abilities differently. Abilities can be understood as variants of productivity, where the productivity of the firm is broken down into two categories. Nocke & Yeaple (2007) defines two different abilities as mobile[1] and non-mobile[2]. The mobile ability is set to travel well from one country to another making firms in possession of such abilities more prepared for greenfield investment. Firms that possess more non-mobile abilities, abilities that are set to travel badly, will seek to expand through Mergers & Acquisitions, because by doing so the firm can acquire abilities from a local firm (Nocke & Yeaple 2007). They call this the *international organization of production*. The forms of FDI are also dependent on the sector in which the firms are a part of. M&A have different conditions that depend on the sector's/industry's characteristic. In sectors where the mobile ability is different between firms, the most productive firms will choose M&A over export and GF. In sectors where the non-mobile ability is the most different ability, the least productive firms will do M&A to gain non-mobile abilities that are specific to the target country. Firms that engage in GF, both in the sector where firms differ in mobile and the sector that differ in non-mobile abilities, are more productive than exporters (Nocke and Yeaple 2007).
Temouri et al. (2008) have also found evidence for the production advantage of multinational firms in a survey of German industries. Firms in Germany with foreign owners do have a heterogeneity (productivity) advantage over German non-multinational firms but find no differences between German multinationals and foreign multinational. This finding strengthens the assumption that firms with multinational production are more productive than exporters.

Firms that have been expanding with FDI, exporting, and have built up a substantially large market share hold influence over their industry, makes us acknowledge the role of monopoly power. In the literature it is evident that the most productive firms operate with the highest markups. The markup is difference between production cost and selling price, and the logical assumption that more productive firms can charge higher markups than less productive ones seem very present. Since it is established that multinationals are more productive than pure exporters (by Nocke and Yeaple), and exporters are more productive than non-exporters, the

[1] Abilities such as technology, and others that can easily be used in other countries
[2] Abilities such as knowledge about the local market, that don't relate well to the target location

gap in markups between these three types of firms should exist. It's certainly evident in De Loecker & Warzynski (2012) where markups between non-exporters and exporters are *dramatically* different. For multinationals, the findings are that they have significantly higher markups than domestic firms, especially firms that have done greenfield FDI (Muraközy & Russ 2015).

De Loecker & Warzynski (2012) find evidence that a firm's markup increases when they enter the export market, which is under a second school of thought to why exporters are more productive. While being exposed to export, firms gain knowledge through the learning-by-doing principle.

Today's tendencies in the global economy are that there is a small share of firms that has large shares of the world's consumer base. These firms operate with multiple margins and uses both FDI and export to reach different markets with their products. "*They choose locations for their plants, export market for each plant, products to export from each plant to each market, exports of each product from each plant to each market"* (Bernard et al., 2018, page 2.*).* They choose the countries of where they acquire inputs for each plant. The way they source inputs to low-cost countries along with many export destinations allow them to charge variable markups. We can understand variable markups as different prices in different markets. Because of this type of value chain, the global firms are unlikely to be measure-zero[3] (Bernard et al., 2018). "*By using US export and import transaction data it is shown that the top 5 percent of exporters that export 11 or more products to 11 or more markets account for 80 percent of the export value. It is the same pattern for importers, the 3% of importers that source 11 or more products from 11 or more countries account for 76% of the import value"* (Bernard et al., (2018) *Global firms p. 28).*

These findings suggest that there are indeed firms in possession of monopoly power, which they exploit to gain large profits while they control a significant share of the market.

This rise of global firms is also explained by the framework of Melitz's reallocation and heterogeneity model.

[3] Where profits-costs equals 0.

2.1 Classical trade theories

In this section I will present the two most important classical trade theories, which is Ricardian trade theory and Heckscher-Ohlin theorem. These two theories suggests that international trade is driven by differences between countries, and that countries specialize in producing goods in which they have a comparative advantage in.

2.2 Ricardian-Trade theory

One of the first formal models of international trade is the Ricardian model of one factor of production. This model was developed by David Ricardo in the early 1800s and explain different countries' absolute and/or comparative advantage in production of a certain good, and how it's giving them an incentive to in produce this good and import goods that other countries can produce relatively cheaper.

Absolute advantage

When a country has an absolute advantage in the production of a good or service it produces the good with a higher productivity or at a lower cost than other countries. This term is also valid when we consider different firms' production of goods and services.

Comparative advantage

When defining a country's comparative advantage in production of a good, we must consider the country's opportunity cost. Opportunity cost, in this case, is the value of the country's best alternative that is not selected to be produced.

In example, a country produces corn and silk, and if it wants to increase the level of production of corn it must decrease the production silk. The reason for this is that resources that are necessary in production, say labour, of these goods are scarce, and by moving labour from the production of silk to corn will decrease the benefits from the production of silk, which is the opportunity cost.

When we mean a country has comparative advantage in a country's production of a good, it is because it can produce that good at a lower opportunity cost relative to another country. If two countries, Italy and Egypt are both producing corn and silk, and Italy can give up less silk to produce more corn than Egypt, Italy has comparative advantage in corn relative to Egypt. This means Egypt can produce silk at a lower opportunity cost than Italy, which gives them comparative advantage in silk production.
It is not possible for one country to have comparative advantage in the production of both

goods.
This is the fundamental assumption in Ricardo's trade theory (Jones 2017).

2.2.1 Ricardian – one factor of production

The framework in this Ricardian model is a two country, two homogenous goods, and one factor of production, labour. There is perfect competition, the production factor is mobile between production of the two goods within a country, but immobile between countries.

The idea behind this model is to show how countries can achieve benefits by exporting goods where they have a comparative advantage in production, even though it does not possess absolute advantage in the exported good.
When the two countries find themselves with no options to trade, they would both produce the two goods, splitting the labour force between the two sectors. When trade is possible, the countries should specialize in producing the product they hold a comparative advantage in, by reallocating labour from production of the good do not hold comparative advantage into the production of the good where it holds comparative advantage.

This also gives counties that hold no absolute advantage in production of any good a comparative advantage in their trading partner's less productive sector.
Consumers in both countries end up consuming more of both goods then what they did in autarky (Jones 2017).

2.2.2 Ricardo-Viner model

The Ricardo-Viner model is known as a specific-factor model and was design to explain the migration of labour from rural to urban areas. The model is similar to the framework of the *Ricardian one factor of production* model, two countries and two sectors, with the addition of two factors. Capital is used in the urban area, and land is used in the rural. These two factors are specific to their sector and are immobile. The last factor is labour, which is mobile. There is perfect competition in each market. There is diminishing returns to scale which means that a there is a decrease in output of the good per extra worker joining the sector (Jones 2017).

Here, we also start off in autarky where it used to measure what effect changes in real price of one or both goods, and real wage in one or both sectors have on labour allocation, output and factor returns (Jones 2017).

When considering free trade which lead to a price increase in one of the goods, the sector producing the now higher priced good will become an exporting sector. This would lead to

changes in the structure of the country. First off, the profits in the exporting sector will rise, because the rise in wages could take time to adjust. The marginal production would increase above the current wage, which creates the incentive to reallocate labour from the other sector to the exporting one, which is done by increasing wages in the export sector. The sector that now suffer a drain in labour will increase wages to able to compete for workers, and the output in this sector will decrease. These changes will continue facing off until there is an equilibrium between wages and marginal product in both industries (Jones 2017).

2.3 Heckscher-Ohlin theorem

The earlier research, upon to Krugman's monopolistic competition models used Heckscher-Ohlin theorem to explain international trade. This theorem along with Ricardian trade theory have had huge influence in research and the perception of international trade. Heckscher-Ohlin explain trade by using countries differences in factor endowments, and this can be interpreted as a long-term effect of the Ricardo-Viner model, where the specific factors now are eligible to move between sectors.
The basics of this theory states that "*A country exports those commodities produced with relatively large quantities of the country's relatively abundant factor"* (Jones. RW 1956-1957).

The Heckscher-Ohlin theory is also of the comparative advantage school and started off with the modelling of a capital abundant country and a labour abundant country. These countries will by the rule of comparative advantage import the products of which they are relatively scarce of. The capital rich country will export products that demand more capital in production while the labour rich country will export products that are more labour intensive. In the Heckscher-Ohlin model the capital in mind is not total capital of a country, but rather the capital per worker. A large, populated country like India has more capital than a small country like Norway, but Norway has more capital per worker. The Heckscher-Ohlin theory then predicts that Norway should be exporting capital intensive products to India and import labour intensive products. They assumed that all countries shared the same technological knowledge, which was different from Ricardo.

2.3.1 The model

The model is a two-country A and B, two-factor C[4] and L[5], two-commodity framework X and Y. This is known as the H-O model with influence of Samuelson, HOS model. There are given some assumptions to the model: Each commodity in both countries is sold in a perfect competitive market and produced under constant returns to scale. There are no costs connected with trade or transport, and the prices are equal in the two countries. Capital and labour are homogenous and fixed, and fully employed in each country. The quality of each factor is identical, as well as the production functions. Commodity X is always produced by using more capital than commodity Y.

These assumptions are given because we need to examine the countries' factor intensity. We must also define the relative factor abundance for each country. This is given by the countries' pre-trade ratio of factor prices (Jones. RW 1956-1957).

(1) $\left(\frac{p_c}{P_L}\right)_A < \left(\frac{P_c}{P_L}\right)_B$

In this case country A is relatively capital abundant, and capital is cheaper in the capital rich country pre-trade. Because of the relatively cheaper capital in country A, commodity X is less expensive to produce in this country, and it will export this good to country B.

The alternative definition to the pre-trade price of capital is to look at the physical factor endowments. By this definition, which is more comparable with the comparative advantage mentioned above, the country is abundant with capital if it is endowed with a higher proportion of capital to labour than the other country.

Country A is capital abundant if:

(2) $\frac{K_A}{L_A} > \frac{K_B}{L_B}$, where K is capital and L is labour

Which is the same as

$$\frac{L_A}{K_A} < \frac{L_B}{K_B},$$

(Jones. 1956-1957).

[4] Capital
[5] Labour

This is telling us the capital-labour-ratio between the countries, how much capital there is per worker. In country A there is more capital per worker than in country B which defines country A as the capital Abundant country and country B as the labour abundant country.

The differences between the pre-trade factor price ratios are that they are determined by supply and demand and are related to pre-trade commodity price ratios. On the other hand – factor endowment differences create a bias on the supply side of which commodity the country is relatively richer in, X for capital rich and Y for labour rich. The bias rising from

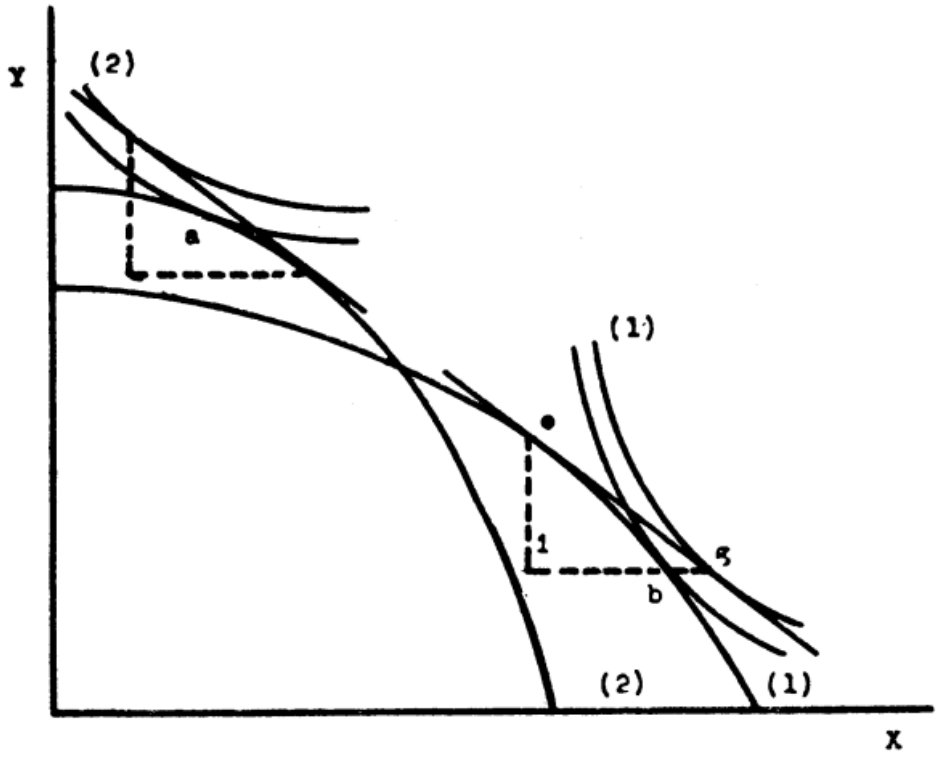

Figure 1 Transition Curves, Jones. RW

differences in factor endowments can been seen in the countries' transition curves. A country with abundant capital will have a flatter curve than the other country along any ray from the origin as can be seen in the figure. *"If the output of the two commodities is in the same proportion in both countries, the relatively capital abundant country will be able to expand its production of the capital-intensive commodity at a lower opportunity cost than the other country"* (Jones RW 1956-1957 p. 3). By this we understand that the capital rich country has a supply bias in the capital-intensive good/commodity.

This can be used when investigating comparative advantages. This term has been relevant in international trade since it was first described in Ricardian trade theory.

There are a few variants of the Heckscher-Ohlin model, which have been developed to describe international trade more accurately, and the H-O-model have had its share of criticism. The criticism is based on that the theory comes with uncertainty because it rarely has been subject to logically complete test.

2.3.2 Leontief paradox

The Leontief paradox stems from the findings of Leontief in the 1950s where he found evidence for that the US, that generally have a high capital per worker ratio, in fact had lower capital/labour ratio in exports than in imports. Leontief (1956) states that *"The US exports commodities which, on average, absorb in their production less capital and more domestic labour than would be required for the production, in this country, of those goods which it apparently finds comparatively cheaper to import." (Leontief 1956 page. 14)* Which implies that the US is/were at the time labour abundant and scarce in capital.

The Leontief paradox does not account for human capital and the difference between skilled and unskilled labour. Later published research has come up with solutions to this paradox, by using the Linder Hypothesis.

2.3.3 Linder Hypothesis

The Linder Hypothesis was suggested as a solution to the Leontief Paradox in 1961 by Staffan Linder. From the Leontief paradox we understand that the Heckscher-Ohlin theorem does not always fit with reality, but Linder proposed a new thinking to solve the issues with the H-O model. The Linder hypothesis suggests that countries with similar per capita income will consume goods of similar quality which will lead them to trade with each other. A country will specialize in the production of certain high-quality goods and trade these goods with countries of similar per capita income ratio that demand the said goods. This a different perspective to the original H-O model which suggests that countries with differences in income levels should trade with each other, and there is a bias in the supply. Whereas the Linder hypothesis introduces a demand-based theory of trade, and countries with similar demands would develop similar industries and trade with each other with differentiated goods. Countries participating in the global economy fall into different categories based off their per capita income levels. For an easier explanation we will operate with high-income and low-income countries. Hallak (2010) have found evidence for that the Linder hypothesis does not necessarily holds up with reality. His findings from examining high-income and low-income countries' trade patterns show that high-income countries import 81,1% of its goods from other high-income countries, and 18,1% of their imports come from low-income countries.

While this seem to match the hypothesis, it fails when you view the trade patterns of low-income countries, where imports from high-income to low-income countries are 81,5% and the remaining 18,5% of imports are from other low-income counties (Hallak 2010). An investigation of aggregate global trade between countries, rich and poor, finds weak or none support for the Linder hypothesis.

While the Linder Hypothesis struggle to show its relevance when you only factor in aggregate world trade, it finds support when you examine trade at sector level. By expanding the hypothesis from aggregate trade with the addition of industry-level data you capture the role of product quality. This is supported by evidence from Hummels and Klenow (2005) and Hallak (2006) that show how high-income countries export more of their higher priced goods into high-income markets if a higher price is an indication of products with higher quality. Hallak (2010) has confirmed the Linder Hypothesis by expanding with sectorial level data and further states that "*aggregation across sectors induces a systematic bias against finding support for Linder's quality-based theory*" (Hallak 2010, page. 14).

2.3.4 Heckscher-Ohlin-Vanek (HOV)

Because of the limited assumptions in the HOS-model to only two goods and two factors, the model has struggled to mirror the real world. Now, by adding a third good into the model it was shown by Melvin (1968), that there is indeterminacy in production and trade if all three goods are produced. While we have these, then new, assumptions, a country that's relatively rich with capital does not have to export the most capital-intensive good.

This framework was considered by Vanek (1968) and used this in his many-good, many factor model. Vanek used the same assumptions with identical constant returns-to-scale, identical homothetic preferences, no factor-intensity reversals, perfect competition, at least as many products as factors and factor price equalization (Baldwin & Domeij 2008). "*The results that evolved under these assumptions is that the amount of a particular factor of production embodied in the country's net trade of goods and services equals its endowment of this factor minus its share of world consumption multiplied by the world endowment of this factor*" (Baldwin & Domeij 2008 pp. 43-44)

The general HOV relationship can be given as:

$$F_k^i = V_k^i - s^i V_k^w$$

"Where F_k^i is the amount of any factor k (where $k = 1, \ldots . M$ embodied in the vector of net exports of any country i where $(i = 1, \ldots T)$ whose net exports of a good equal that country's production of the goods minus its consumption of the good. V_k^i is the country i's endowment of this factor, $V_k^w \left(= \sum_{i=1}^{T} V_k^I\right)$ is the world endowment of this factor, and $s^i = (Y^i - B^i)/Y^w$ is country i's GNP, Y^i, less its trade balance, B^i, or its aggregate consumption expenditures, C^i, $(Y^i - B^i)$ on goods and services divided by world GNP, Y^w is also equal to the world's aggregate consumption of goods and services, C^w. Thus, s^i is equal to country $i's$ share in world aggregate consumption, or C^i/C^w. If $B^i = 0$, s^i is the country's share of world GNP" (Baldwin & Domeij 2008 p. 44).

In this model we operate under the free trade assumption which gives the same product prices in each country, and each country has the same identical preferences. This let all countries have the same proportion of total expenditure on a particular good. The differences arise in the amount spent on each good due to the country's aggregate consumption spending. A country with 10% higher aggregate consumption spending than another, consume 10% more of all goods than the other. Because of identical, constant returns-to-scale production functions exist for each good in all countries, factor intensity reversals are ruled out, and factor prices are equal for all countries. Under the equilibrium conditions given by free trade, in this type of model, the amount of each factor used per unit of output of each good is the same for all countries.

The countries does then, not only consume commodities in the same proportions, but also consume the productive factors embodied in the goods in the same proportions, with the absolute amounts of spending on embodied factor services varying in proportion to levels of consumption spending among the countries (Baldwin & Domeij 2008 p.45)

In example (from Baldwin & Domeij p 45) *If a country's consumption level represents 5% of the world's consumption level (s^i=5%) the country consumes 5 percent of the world's supply of each factor of production. Consequently, a country whose endowment of a productive factor (V_k^i) is greater than the country's consumption can the factor ($s^i V_k^w$) becomes a net exporter if the factor to the extent of this difference: $F_k^i = V_k^i - sV_k^w$, and opposite when the*

country's endowment of the production factor is less than the country's consumption of the factor. Opposite means it will become an importer.

To sum up the Heckscher-Ohlin-Vanek model, we can say it defaults from reality in some of its assumptions that have been modernized in models more relevant for our times, post 2003. This standard HOV-model have assumptions that all domestic and foreign producers (firms) in a particular industry produce a homogenous product while it's produced under constant returns-to-scale. There are no transportation costs related to the trade between countries, in fact there are no transportation costs at all, which compared to new trade theory is one of the most important factors to why some firms chose to export their products. With this assumption a country will either export or import this product depending on its relative factor endowments, and the lack of intra-industry trade is limiting the validity of the whole Heckscher-Ohlin theory.

3 Monopolistic Competition

Until late 1970s there was a general mindset in international trade theory that perfect competition models explained the development of markets and trade (Neary 2010).

Although a new idea of understanding trade was developed in the 1930s by Chamberlin, with the assumption of monopolistic competition, it struggled to grasp a lot of relevance in the research and monopolistic competition was not hugely recognised until the late 1970s where Krugman (1979 and 1980) developed his model of monopolistic competition using Dixit and Stigliz' (1977) model of monopolistic competition and product variety (Tsoulfidis 2009 & Neary 2010).

It was because of the polarisation between the existing classical trade models, perfect competition and monopoly Chamberlin introduced monopolistic competition, after his observation of markets where product differentiation and market power were significant (Elsner et al. 2015).

The key differences between perfect competition and monopolistic competition are product differentiation. In a monopolistic competitive market products are close substitutes with distinct features. In a perfectly competitive market, all products are identical. In monopolistic competition firms act as a price setter and not as price takers as in perfect competition. Information between agents in the market can be asymmetric, a difference from full

information in a perfect competitive market. Firms can achieve scale economies, which is not a possibility in a perfect competitive market.

Krugman (1979) developed a model where trade is driven by economies of scale and not differences in technology and factor endowments, which are the drivers in the classical trade models. He also proved that economies of scale arise from the firm's internal attributes and not external, like it's assumed in earlier models (Krugman 1979). Economies of scale are achieved when more units of a good can be produced, but at lower input cost.
A year later he published another model which included the effect the home market's demand has on a country's export and the transportation costs for the exported goods.

3.1 Krugman's Home Market Effects on the Pattern of Trade

With a more modern understanding of how markets operate, Krugman derived an analyse of which products are exported from a country. With a strong belief that trade is inspired from scale economies he considered the necessity of concentration of production near a firm's largest market to minimize transportation costs.
When a number of firms, independent of country of origin, are producing and selling not identical, but similar goods, the firm with the highest demand in their home country tend to export more products. This is because using scale economies firms can serve a relatively large group of consumers in their home country with lower per unit costs, and since the unit's costs are lower than a firm in a country with a smaller demand, can more cheaply export their goods. This because a firm in a country with a smaller demand do not achieve the same level of scale economies and has a higher per unit cost. Hence, the home market effect describes the tendency that large countries are net exporters of goods that has a high transport cost and that firms carry strong economies of scale (Krugman 1980).

3.2 Heterogeneity and reallocation

The Melitz work from 2003 explain the case of why some firms opt into new foreign markets and some do not. Through the last decades of the 1900s countries became more liberal to trade between other countries and exporters could more easily (cheaper) gain access.

To explain how trade liberalization affect firms I will use examples of when a country goes from a closed economy (autarky) to an open economy. A country is a closed economy when there are no import or export, and it is totally reliant on domestic production. This also limits the selection of goods for the consumers. Even though there are only a few, if none, closed economies today, the theoretical transition from closed to open economy is helpful to explain the main mechanics of trade liberalization and intra-industry reallocation.
A closed economy is self-sustaining, and the firms only use domestic raw materials to produce their goods. The market dynamic is made up of consumers and sellers (firms), with a number of firms in a sector at a given level of production efficiency. In this context firms only compete against other domestic firms for consumers and labour within the country.

From Melitz (2003) there exists an equilibrium in a closed economy where the two conditions: *free entry* and *zero cut-off profit* meet. This is the profit level a firm must reach upon the production-level-draw in order not to exit the market. To enter the market, firms must invest an irreversible fixed cost, termed a sunk cost. This sunk cost is equal for all entering firms, while the firm's efficiency in production is differently distributed across firms within the sector.
Comparing this to the open economy the cut-off in the closed economy is at a lower level, thus a firm in a closed economy can survive with a lower level of efficiency in its production than in an open economy.

When going from a closed to an open economy firms will face opportunities such as new trade partners and a larger number of possible new buyers(markets) which could yield higher profits, and threats such as more competition which could possibly lower profits or lead to market exit.
If a country directly changes from autarky to a trading economy, a firm must decide whether it should expand into foreign markets. Expanding into new markets will demand a new sunk cost because the firms must in some way get to know the new markets and the new markets must know of the firm's product(s). Managers of businesses are more concerned by the fixed sunk cost than it is of variable costs related to transport of the goods (Melitz 2003).
In the transition to an open economy the zero-cut-off profit rises to a higher level than in autarky, which means that the firms with small positive profit in autarky (smaller than the cut-off profit in an open economy) will no longer have a positive profit and must exit the market (Melitz 2003)

To sum up; the transition from a closed economy to an open one; the average productivity level in a sector increase, thus forcing out the less productive firms. The productivity is the ability to produce goods at level with less inputs (cheaper) or produce goods of a higher quality at the same price as a lower quality good. Consumers enjoy a broader product variety, which gives welfare gain. Firms discover their productivity level and decide after discovering whether it should sell in foreign markets.

3.2.1 Heterogeneity and comparative advantage

A lot of the facts about exporting firms and heterogeneity has already been mentioned earlier, but there are some facts that need recognition. As we very well know, Melitz's work from 2003 show us that only the most productive firms export, but it says nothing about the host country's comparative advantages. In Bernard et al. (2018) it is shown that only a small part of US manufacturing plants export and the variation in percentage between industries are large. The average share of exporting in each industry is about 35%, ranging from 15% in printing to 75% in computer and el. Products (Bernard et al. 2018). Now, a side note about comparative advantage. Comparative advantage is essentially a country's ability to produce a good at a lower opportunity cost than its trading partners. This theory is explained by David Ricardo and is said to be one of the fundamental reasons to why countries trade with each other. Import the good which they can't produce well and export the goods they have a comparative/relative advantage in. We can draw parallels with comparative advantage to heterogeneity in firms. When we note us that the US electronic production sector has 75% of firms exporting, we understand that US has been technological more advanced for many decades, when we take in consideration in the large tech companies that resides in the US.

From a research paper in 2008 it is shown that 55% of European firms from countries with non-exhaustive data export, while about 40% of European firms from countries with exhaustive data export, which is higher than the US average (Mayer & Ottaviano 2008). They also find that 1% largest exporters in these countries account for 45% of aggregate export. In Chinas manufacturing sectors the share of exporters is 30%. Fewer than 20% of exporters sell less than 10% to foreign markets and about 40% of the exporting firms sell more than 90% of their products abroad (Lu, 2010).

3.2.2 Export

Exporting goods is just one of a handful of methods to gain access to foreign markets. In simple terms export can be described as a product that is being produced and sold by a firm in

one country to a consumer in another and sent from the location of production to the location of the consumer.

Although this seems straight forward and simple, the mode is more complex, and firms must have a look at their own abilities before they decide to enter new markets by exporting their products. I have earlier touched upon the mechanisms that occur when an economy goes from closed to open. The mode of access to foreign markets in the articles I have used in explaining trade liberalization and the change from closed to open economy all use export as examples. In this part I will describe export more nuanced to give a more complete picture of why entering or not entering the export market is an important decision for firms and industries.

We saw from the part of trade liberalization that when an economy changes from closed to open or when trade liberalization increase, firms face a decision on whether to enter the foreign markets or not. There is also a change in firms market share and the new share is somewhat decided through the efficiency of the firm.

To enter the export market the firm must pay a sunk cost as an entry fee. This sunk cost cover costs such as advertisement, getting information about the consumers, establishing distribution connections, etc. The cost of entry is of a significant size and some firms shy away and decide not to enter, from Melitz (2003) are these the firms with the lower level of production efficiency. So, what drives the firms into the export market?
Of course, the main incentive to expand into new markets are increased profits, and firms will only pay the sunk cost if the expected future profits are larger than the entry fee and the costs of operating in foreign markets. A good way to analyse the exporting firms are to look at the changes in cost structure and income when a firm goes from a non-exporter to an exporter.

Let’s start with a firm that both produces and supply domestic only, in an economy that is regulated and thus face little foreign competition. Now the competitors are mostly from the same country, which means the real wage is the same. When entering a market, the firm is given a level of production efficiency, and the level of production efficiency is distributed across different levels and different firms from high to low. If the firm has a high level of production efficiency it operates with larger profit margins and an advantage over the other firms in the sector. Here the costs are made up of entry fee, you must also invest to attend in the domestic market, fixed costs of running the plant and variable costs in the production.

Income/profit comes from domestic consumers.
Some firms, even while in a regulated economy, will exit because of their low production efficiency. It therefore exists a zero-cut-off profit used my Melitz (2003). The last firm to stay in the market is the firm which have their profits equal to the entry fee with zero profit.

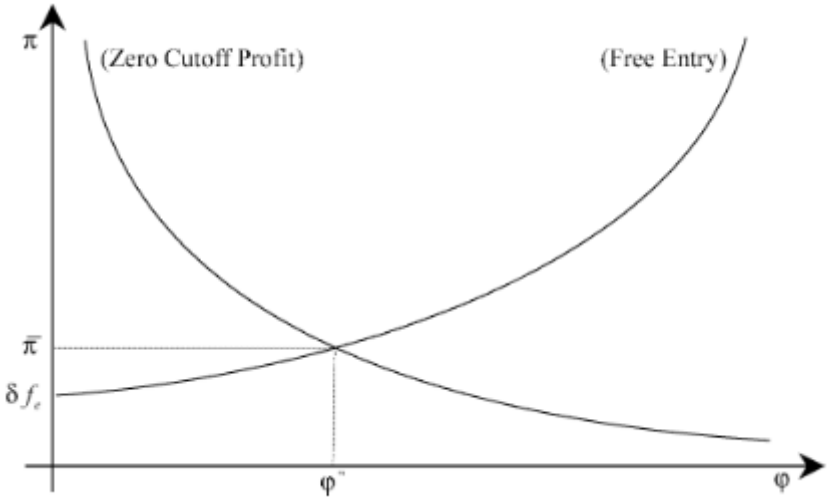

Figure 2 Determination of the equilibrium cut-off. (Melitz 2003 p. 10)

The figure illustrates the relationship in a closed economy between productivity and profit, where π is the profit and φ is the productivity level. $\bar{\pi}$ is average profit and $\varphi^*$is the cutoff productivity level. Firms with a productivity $\varphi < \varphi^*$ will not earn positive profits and exit the market, the firm located at $\varphi = \varphi^*$ earn 0 profit. Because this is the only firm in the industry not earning positive profits the average profit is positive. The equilibrium is meant to show how the cut-off productivity level and average profit determine the existence of firms. The free entry curve represents the sunk cost a firm must invest to enter the market with f_e and the δ is the probability of a bad shock that could happen. The higher probability of a shock the more productive a firm must be.

When the change from a regulated economy happens, firms must use their knowledge of their production efficiency to decide whether it should start exporting. The decision is driven by economic factors, but it should also be driven by the need to protect their share of the domestic market.

The economic factors affecting the decision to enter are the now well-known sunk cost and expected future gross profits and expected exchange rates, from Sanghamitra. D, Roberts. MJ & Tybout. J (2007), where they investigated export market entry with Colombian firms.

Due to less regulation, there will now be a flow of foreign exporting firms targeting the domestic firm's market share, firms which are on average more productive than the average domestic firms (Melitz 2003), which means the zero-cut-off profit is lower. The response of the domestic firm relies on its productivity and there are three options. The three options stems from firm heterogeneity, and the least productive firms are forced to exit, the medium productive firms will stay in the domestic market and the most productive will start exporting (Melitz 2003).

The firms that start exporting are the ones that expect the profits to be larger than the cost of entry and the costs of operating. These firms will make up for the loss of domestic market share by collecting profits from shares in foreign markets. The firms that decide not to export and only sell to the domestic market loses some shares and profits. This is the modern day of resource reallocation and by letting the most productive firms have the largest shares the whole industry is more productive.

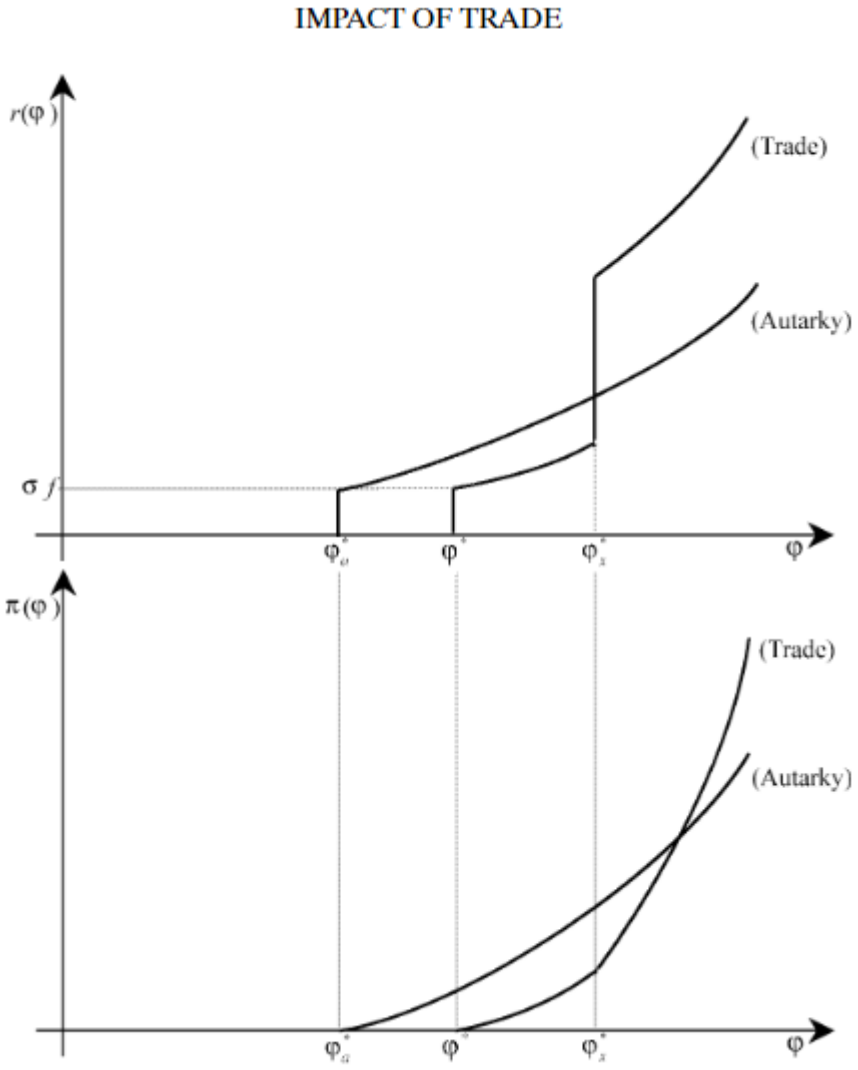

Figure 3 The reallocation of market shares and profits (Melitz 2003. p.20)

The figure illustrates the reallocation of profits and market shares when a country goes from an autarky to a trading country, defined as the impact of trade. $r(\varphi)$ *show revenue and* $\pi(\varphi)$ *show profit as function of productivity. The entry condition* $\delta\ f$ *is the same as in a closed economy, but the Zero Cut-off profit curve shift downwards, and the cut-off productivity level increases from* φ_a^* *to* φ^**. Firms with a level of productivity below* φ^* *will no longer earn positive profits and exits the market. Firms with a productivity level higher than* φ_x^* *will enter the export market. Firms located in the space* $\varphi^* - \varphi_x^*$ *only sells to the domestic market, explaining the jump in profits and revenue when the productivity is* $\varphi > \varphi_x^*$ *with access to the export market.*

The importance of sunk costs as an entry barrier is comprehensive and is highlighted in Melitz (2003) Sanghamitra. et. Al (2007) and Bernard & and Jensen (2004) as the main factor along with heterogeneity to why only the most productive firms can export. The role of heterogeneity should be elaborated on further and in the later parts I will explain how heterogeneity also encourage other forms of market penetration, such as foreign direct investments trough greenfield and, mergers and acquisitions.

Trade liberalization is not the only factor to promote export. Governments can subside domestic firms to incentivise entry in the export market. This can be done by covering the costs of entry, covering the fixed costs of operating in foreign markets or subsidies linked to plants' export revenue (Sanghamitra, et. Al 2003). They find evidence from Colombian exporting firms that the best way to subside exporting firms are through revenue subsidy.

A depreciation of the local currency can also affect the level of exporting. A lower exchange rate makes the domestic firms' products more attractive to import for other countries.

3.3 Multinational Production

One of the other forms of market penetration is horizontal FDI, or multinational production. The way this form of gaining market access is different from export, is that instead of transporting goods from one area, the location of production is placed within the target market(s). Earlier theory has discovered that there exists a trade-off between proximity and concentration, which I will elaborate on in a later part.
Horizontal expansion has different names and can occur in different ways, either through

Greenfield FDI or through mergers and acquisitions (M&A). The term multinational production also includes vertical FDI which I will come into at a later stage.
From the Melitz (2003) article, there are no mentioning of Multinational production. Research[6] after Melitz have investigated the role of multinational production, and the results are similar to his findings. The similarity is the way a firm decide to enter foreign markets, which depend on the firm's productivity, and the level of productivity decide which mode of penetration is optimal (Nocke & Yeaple 2007).

3.3.1 Horizontal expansion

A firm have done a horizontal expansion when it replicates its own plant or affiliate in a new location. You have the horizontal FDI when it is done in a foreign target country to gain access to the market in that country or area the country belongs. Firms choose to do so when the costs of operating an extra affiliate or plant are lower than producing at home and then export their products.

In this section I will explain two forms of FDI: GF and M&A, by going through their differences and characteristics.

The basic difference between these two forms is that by doing outward GF foreign investment the firm essentially copy an already existing plant in their possession to the location in the target country. Firms use the technology and skills they already possess and produce their products in at least one more location. According the Nocke and Yeaple (2007), firms pick their mode of FDI based on their "capabilities" (or abilities), which from now on will be termed as skills, which they put in two categories "mobile" - and "non-mobile". An example of a mobile skill is technology used in production of a good, a perfectly mobile skill, which is easy to move or copy to a new area. An example of a non-mobile skill is the knowledge of how do advertise to the home market. Populations of different countries can react differently to advertisement, and advertisement that gain consumers at home do not necessarily generate consumers in a foreign market.
Firm heterogeneity rises from differences between firms in their skills which again affect the firms' productivity. Heterogeneity is also dependent on the industry, and the industry "decide" what set of skills that are important to possess to gain an advantage over the

[6] After Melitz (2003)

competitors.

The evidence from Nocke and Yeaple (2007) show that firms belonging in an industry where the mobile skill is the heterogenous one, the most productive firms will conduct FDI instead of exporting, where the most productive firms do so through Mergers and Acquisitions and second most will do GF. In the industries where firms are different in the non-mobile skill the most productive firms will conduct FDI through greenfield, and the least productive though M&A, here exporters are more productive than the firms choosing to do M&A. The logic behind M&A in the "non-mobile industry" is that a firm can acquire a local firm, and by doing that it also acquires the local firm's non-mobile skill that is specific to the target market. These findings conflict with Helpman's, Melitz' & Yeaple's (2004) conclusion that all firms doing FDI are more productive that exporters, but this conclusion did not separate GF and M&A and treated them both as one single form.

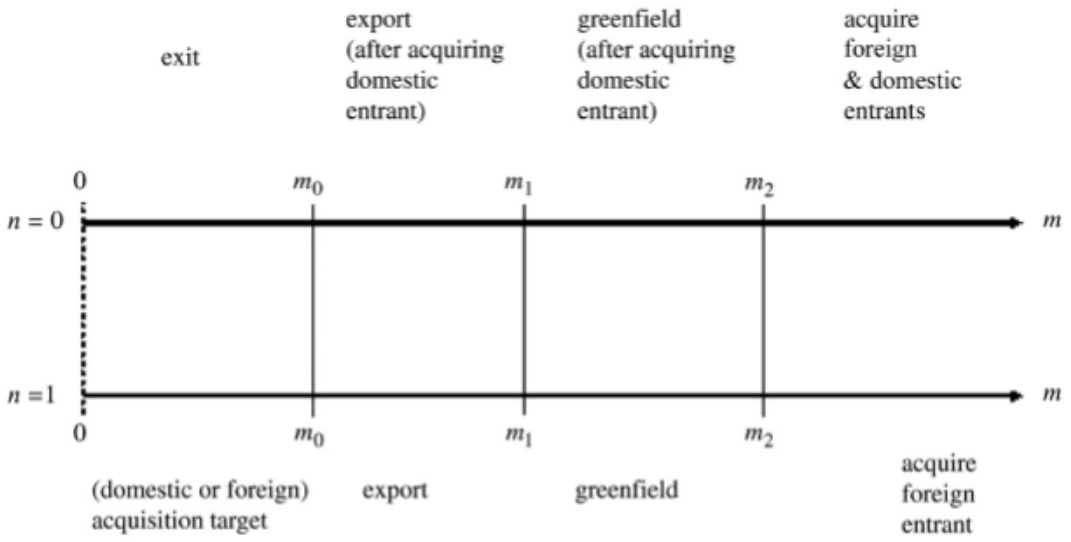

Figure 4 Nocke and Yeaple (2007) - The international organization of production in industry M, where heterogeneity rise from the mobile skill.

The figure illustrates how the firms' capabilities distribute the production strategies. m *represents the mobile capability and* n *the non-mobile. The strategy to enter markets changes with the level of the mobile capability, and if the firm possess a non-mobile capability. The firms with a non-mobile ability* $n = 1$ *and a low degree of mobile capability* $m < m_0$ *become acquisition targets. Entrants with* $n = 0$ *and* $m < m_0$ *exit. Firms with a mobile capability in*

the space $m_0 \rightarrow m_1$ export, $m_1 \rightarrow m_2$ builds a new plant and firms with the best mobile capabilities acquire foreign targets.

There is also here a similarity with Melitz (2003), in that also the least productive firms will exit the market, but that's if they do not possess a local skill that is desirable for a firm to acquire.

While the firm's production efficiency is important in determining whether it should expand by doing FDI, the role of trade costs must also be included. From Nocke and Yeaple (2007), by lowering the costs of trade, such as transportation of goods and tariffs, they find a decrease in the share of firms engaging in both GF and M&A. Greenfield disappears when the trade costs fall to the limit level, but M&A will still occur if the disadvantage of using a non-mobile skill in a foreign country is small. This is the trade-off between proximity and concentration, which I will explain elaborate on later.

Now, the difference between GF and M&A are that GF relies more on the firm's internal skills as it is a new subsidiary build from the ground with the purpose of serving the same way as the existing one(s). M&A on the other hand is more of a transfer of ownership of existing assets. Even though there are differences in the two modes, we still find similarities between them. Most of the time both modes come from countries that fall into the "developed" category (Davies et al. 2018). There are traits that target-countries possess that suits the two types differently. M&A are less attractive when there exist barriers between the host and target countries, institutions are weak, and the target country have low financial development (Davies et al. 2018). Greenfield are reliant on the firm's own competitive advantages, taxes in the target country and the financial development at home (Davies et al. 2018). In general, FDI is more common between countries with large market size and low barriers between them, where M&A most often comes from and goes to large GDPs. There is more GF investment in countries with low per capita income (Davies et al 2018). A reason for this could be that some work in plants does not require higher education or skills, hence the firms can pay lower salaries to the workers. Nocke and Yeaple (2008) also find evidence for this, where M&A is the preferred form of FDI when the host and target country share similarities in production and costs and GF is the more important one when the FDI goes from a high-cost country to a low-cost.

Cost comparisons - M&A vs. GF

When comparing the costs of the two modes we must focus on the price of the process of completing a successful M&A relative to the investment done in a GF. The process of doing M&A include finding a suitable target, the price of the takeover, further challenges that follows in setting up the transaction and the cost of the transaction itself. (Davies et al. 2018)

Stylized Facts – Horizontal FDI

The stylized facts of horizontal FDI are now that 1) Firms conducting FDI are in general more efficient than exporters. 2) Firms engaging in GF FDI are on average more efficient than firms doing M&A. 3) The mode of foreign direct investment are dependent on the "level" of target country, developed countries receive more M&A and developing countries receive relatively more greenfield investment.

3.3.2 Vertical expansion

By expanding vertically, we mean that firms integrate a link into their value-chain. Example a firm that's originally manufacturing shoes start manufacturing shoelaces as well, making them independent of shoelace suppliers. It can even go further; firms can own every link in the value chain from natural resource to end-product. In example, IKEA owns their own forests from which they get the materials to produce furniture.

When we talk about vertical foreign direct investment, we don't mean that firms necessarily try to penetrate markets through sales in the same way as horizontal FDI, but instead lower the costs of production and increasing their profit margins by eliminating costs to suppliers. By setting up subunits in other countries than the firm's home country it can take advantage of inputs or services used in production that are abundant in the host country, and inputs that might be scarce in the home country. A very common situation in the organization of a multinational firm is to locate their headquarter in a high skilled labour country and then vertically invest those links that demand less skill and education to a country where the general labour force is of low skill. This typically the production of the good. By doing so the multinational enterprise can exploit the labour force's low wages to claim lower variable costs in the production. Essentially the vertically engaged MNEs seek to exploit international factor price differences (Baltagi. BH et al 2006).

Another difference between firms engaging in vertical FDI and firms doing horizontal FDI is that the vertical integrated firms tend to export their goods and not produce it locally, like with horizontal FDI.

Together with horizontal FDI, vertical FDI make up a more complex structure than just singling out one of the forms. Now multinational firms tend to both forms of FDI, (horizontal and vertical) because the motivations behind gaining market access and integrate links to have lower costs is a motivation for all firms.
There are three additional types of FDI; Complex FDI, export FDI and networked FDI.

Complex FDI

Complex FDI is the firms that organize their structure both with horizontal and vertical expansion but are purely none of the modes. While the earlier models of FDI was mainly made up of two-country cases where you either invested for market access (horizontal) or for factor access (vertical), we now see more of the effects of third countries in the models. Baltagi et al (2007) finds evidence that the linkage between host countries is positively related to the goods traded by multinationals but negatively related to trade costs. To easily describe complex FDI you can imagine a firm that owns a plant, mainly to serve the local market exports to a third country from that plant, this is the horizontal type of complex FDI. Or the vertical type, when a firm have invested for cheaper inputs, it exports directly from that plant to a third country (Baltagi et al. 2007)

Export-platform FDI

This is the FDI mode for firms that have subunits in foreign countries that produce goods and with a purpose of exporting to third countries from that subunit.

Networked FDI

Baldwin & Toshihiro (2013) did find, using a four-way sales and sourcing split (host country, home country, other countries in the region and the rest of the world), a pattern that suggests many subunits are part of international production networks. This is called networked FDI to shift the focus of the characteristics of individual subunits and parent-subunit pair to interactions among subunits.

Earlier the FDI models were build out of two country models, either to gain market access (horizontal) or to gain factor access (vertical). We see today is that multinational enterprises tend to do a mix of the two, for sourcing and proximity to the markets.

3.3.3 Proximity-concentration trade-off

Even though today's trend is to have a more complex structure of subunits and firms both export and build plants horizontally, the earlier theory has shown that firms stood above the decision to whether export their products or do FDI to gain market shares. The option of what to do is by Brainard (1993a) called the proximity-concentration trade-off. By this model firms pick the most cost-efficient way to serve a foreign market, either by exporting their goods or by local production. The trade-off is between proximity to consumers or the concentration of production, giving the firm a possibility to achieve scale economies. By operating plants close to the consumer, with local production, the firms will eliminate the costs of transport by trading them with costs of operating the plant.

Trade costs consists of transportation costs, tariffs and other frictions limiting trade. The proximity-concentration trade-off creates the term "tariff jumping", and the more frictions to trade (export) that exist, the more willing the firms are to do horizontal FDI. This theory suggests that with high trade costs and trade barriers, firms will choose to invest abroad rather than exporting to avoid the costs of transportation, and when low trade costs and trade barriers firms will concentrate production and gain economies of scale. His finding is in line with the theory, and firms do export less – and do more FDI when barriers of trade are present. FDI is also increasing in language similarity, political risk, and adjacency (Brainard 1997).

3.3.4 Factor-proportions

The factor-proportions hypothesis has been another explanation to firms' actions cross-border. This hypothesis plays more off to why firms vertically expand, instead of horizontally like the proximity-concentration trade-off theory.

With the factor proportion theory, we understand that firms vertically integrate their production to foreign countries to take advantage of factor-price differences between countries Brainard (1997).

3.4.1 Liability of foreignness

When entering new markets, especially foreign markets, the decision contain considerations about the firm's strategic placement of location, productivity, costs of entering and possible profits. In addition to an entry cost, a firm operating in a foreign market, through export of goods or a production facility or an affiliate suffer costs that local firms does not incur. This is the liability of foreignness (LoF) and is well in the topic of international trade and business

strategy. It was brought to light when Hymer (1976) and Kindleberger (1969) asserted that multinational firms face costs coming from differences in cultural, political, economic aspects giving them a competitive disadvantage to domestic firms. In how to overcome the LoF, Zaheer (1995) has studied Japanese and American trading rooms operating across each other. This industry was selected because it is competitive, global, undifferentiated products and the cost of operating cross-border should be minimal.

"Liability of foreignness can arise from at least four, not necessarily independent sources: 1, costs directly associated with spatial distance, such the costs of travel, transportation, and coordination over distance and across time zone; (2) firm-specific costs based on a particular firm's unfamiliarity with the lack of roots in a local environment; (3) costs resulting from the economic nationalism; (4) costs from the home country environment, such as restrictions on high-technology sales to certain countries. (Zaheer, 1995, p. 3)"

For foreign firms that suffer this kind of disadvantage, they must have other abilities specific to the firm to make up for the liability to be able to make them competitive, abilities that the local firms do not possess. It can also give the cross-border affiliate or plant extra resources. These two are advantages that are specific to the firm, but another option to overcoming the LoF is straight up trying to copy the structure of successful local businesses as some form of isomorphism (Zaheer 1995). Isomorphism is in this matter a strategy to copy to the structure of a local firm.

The liability of foreignness is likely to have a stronger effect for those multinational firms that horizontally add subunits in foreign markets to gain market shares. This is because these subunits often are copies of each other and does pay sufficiently attention to all differences in the segments of the different markets they operate.

For firms that vertically integrate operations in different countries to its value-chain, for the matter of cost reduction in production and economies of scale, or firms that have subunits with different roles and integration, LoF could affect them less (Zaheer 1995).

The liability of foreignness also differs in sectors, as some sectors are more prone to LoF than others. One explanation could be that some sectors have more regulation by the government and structural differences that is more suitable for local firms with experienced local managers. In the trading room sector, Zaheer has found one area for which the western trading rooms in New York and the Japanese trading rooms in Tokyo are different. The first one is market control. Market control is used by an organization to reward an employee on their performance, such that their contribution to the firm becomes a portion of their income. This

sort of performance-based solution was more used in the western trading rooms. The second is bureaucratic microcontrol, which is essentially rules within an organization. These microcontrols were more comprehensive and rigid in Japanese trading rooms in Tokyo than in western trading rooms in New York.
By comparing a foreign trading room's profitability to the average profitability in a given location, Zaheer (1995), produced an indicator of the Liability of Foreignness to test his hypothesis. He finds evidence for the existence of LoF, with support in his hypothesis 1: trading rooms operating in a foreign market is less profitable than a local trading room. He controlled for age and size of the trading room, and neither was significantly related to a single trader's profit.
Whether the imitation of local firms or firm-specific advantages are the best way to cope with LoF is different in the sets of organizational practices. Zaheer present results that show that trading rooms under stronger supervision preform at a lower level than the average local trading room.

Trading rooms with strong use of market control compared to the local average perform better and lowers the LoF (Zaheer 1995).

To conclude this, a firm with experience of either form of control performs better in the foreign market, suggesting that firm-specific advantages are relevant. Mimicking local firms without the experience of those practices can lead to a worse performance of the subunit.
If a firm uses isomorphism(mimicking) as an endogenous strategy (Wu. ZY, & Salomon. R 2016), it would reduce the disadvantage of economic and regulatory distance from home country, but cultural disadvantage is still present. When it comes to performance of the firms, inexperienced entrants in institutionally distant countries improves performance by imitating local firms. "Foreign firms from institutional distant markets that fail to adjust their isomorphism strategies suffer performance decrements." (Wu. ZY & Salomon. R, 2016). This could be because of more experienced firms generally perform better than entrants, and by not adjusting to the foreign market correctly or not using firm-specific advantages the new subunit preform worse than their others.

Imitation can offset the liability of foreignness in some respects, and enhance the firm's performance, but there are still disadvantages related to differences between home and target country.
To relate this to firms seeking to expand with subunits (affiliates or plants) into new markets, straight up adopting local firms' practices without the experience of such practise should be

avoided. Because the Liability of Foreignness is increasing with physical distance firms could expand in a step-by-step sort of method by gradually increase the distance from their headquarter as their experience and knowledge of operating subunits abroad grow, this is referred to as the establishment chain. This has though had a declining validity because firms are now more quickly to expand after their birth, and the process of entering new markets are faster, implying that the Liability of Foreignness are of less relevance today than back in the late 1900s (Johanson & Vahlne 2009).

New theory does not write off the Liability of Foreignness, though. In emerging markets with flawed institutional environments foreign firms suffer in performance.

4 The global firm

The theories I have covered to this point, all have their own way of explaining the reason to how some firms choose or have the possibility to do business abroad. In the classical trade models, countries engage in international trade because of comparative advantage, due to either technology in production explained by Ricardo or differences in available production factors as in the Heckscher-Ohlin theory. New theory such as Krugman's modelling of monopolistic competition, economies of scale and product differentiation and Melitz' findings of heterogeneity and reallocation, all explain why international trade does exist, although time and innovation may have outdated some of the aspects in these central trade theories.

I will use this part to explain how MNEs have structured their value-chain, with how they conduct FDI, vertically, horizontally, export and import. I do this to give a better understanding to why it is hard for smaller firms to compete with MNEs and why they can't afford the losses to enter foreign markets.

The trend in global trade of today can be summed up in some key points. 1) A lot of industries are dominated by a few large MNEs that holds huge shares of aggregate international trade. 2) Said firms operate plants or affiliates in different countries to achieve a lower cost of production. 3) They have a large integrated vertical value chain that let the firms access cheaper inputs used in production. The two latter points is a co-ordination issue of import and export, which these MNEs has a well-structured organization to operate. The production plants are to be located strategically in countries that fall into the categories of low-cost or medium cost and are associated with lower wages than the firm's origin country. From these

plants the goods are exported to the plants' designated markets. The plants get their inputs imported from countries that possesses the needed factors used in production. These mechanisms contain multiple margins in the firms' value chain, and they seek out to adjust these margins to yield the highest possible profit. MNEs optimize these relationships and the more productive MNEs are more intensively participants in the global trade, which makes them unlikely to measure zero and with the ability to internalize the effects of their pricing and product introduction (Bernard et al. 2018).

In the research article *Global firms by Bernard, Jensen, Redding & Schott*, it is highly emphasized how "*MNEs has an advantage in four theoretical predictions 1. The firms' decision of which markets to serve, what products to export and the combination of which countries to source inputs from affect the firms' variable production costs and prices. By doing such, the firms understand the effects of a reduction in trade costs on any one margin requires them to account for the decisions effect on all other margins throughout the firm's production chain"* (Bernard et al 2018, page. 3).

"2. Firm decisions along multiple margins of international participation magnify the effects of differences in exogenous primitives on endogenous outcomes. The more productive firms participate more intensively in the world economy along each margin, and then small differences in firm productivity can have magnified consequences for firm sales and employment, as more productive firms lower their production costs by sourcing inputs from more countries, and also expand their scales of operation by exporting more products to each market and exporting to more markets. Small changes in exogenous trade costs can have magnified effects on endogenous trade flows, as they induce firms to serve more markets, export more products to each market, export more of each product to each market, export more of each product, source intermediate inputs from more countries, and import more of each intermediate input from each country" (Bernard et al 2018, page. 3).

"3. Firms of this size and intensive participation in the international economy are unlikely to be measure zero, and their choices can affect market aggregates. This creates strategic market power. Firms with large market shares have great effects on market aggregates which means they face a lower perceived elasticity of demand, which implies they can charge higher markups of price over marginal costs. Variable markups explain the term pricing to market, where firms charge different prices in different markets. The different markups in different markets are dependent on the firm's sales shares within each market.
When firms participate in international markets by exporting multiple products, they

internalize the cannibalization effects from the introduction of new products on the sales of existing products. Multiproduct firms make different product introduction decisions from single-product firms" (Bernard et al 2018, page. 3).

"4. Magnification of exogenous differences across firms through multiple, interdependent, and complementary margins of international participation implies that aggregate trade is concentrated in the hands of a few large firms" (Bernard et al 2018, page. 3).

This research Global Firms (2018) is of relation to the methods set in motion by Melitz (2003) and has its model developed out of firm heterogeneity, where the potential entrants to the market make decision of whether to pay a fixed cost to enter the industry. Their production efficiency is unknown and drawn after the sunk cost (fixed cost) has been invested. After the firms understand their productivity, some will exit due to the cut-off between profits and zero profit/loss. This cut-off ensures that only the firms with productivity above this given level will continue with exporting. The least productive firms will exit the market entirely, even the domestic where exporting was not necessary. The way this mechanism arranges the producers of goods in different industries and sectors it to reallocate resources into the surviving and more productive firms which rises the total level of production efficiency within the industry.

As mentioned, the modelling in the article "global firms" follows the same principles as Melitz (2003), but it has a deeper focus on firm's ability to achieve economies of scale. This also implies that the firms are competing under monopolistic competition which is also the competitive form in Melitz (2003). Global firms' (2018) contribution to the literature of international trade is to emphasize the wide range of firm margins of international participation than earlier work. This boils down to how firms make their decisions regarding export markets, products, sourcing of inputs, and which input to import from each sourcing country. Firms who co-ordinate all these margins and then participate in the international market are set to make up a large share of aggregate sales in their industry. And because of the firms' large market share they have the advantage of choosing price to the markets.

Their empirical results come from analysing US manufacturing industries and shows and compares characteristics between different levels of participation in the international markets though import, export, non-exporters, margins of exported products, number of markets exported to, imported products and number of import countries. It also presents evidence on

the correlations between firm decisions to participate in the international markets along each of the intensive and extensive margins.

TABLE 1
FIRM EXPORTING

		Percent of firms (1)	Fraction of firms that export (2)	Mean exports as a share of total shipments (3)
311	Food manufacturing	6.8	0.23	0.21
312	Beverage and tobacco product	0.9	0.30	0.30
313	Textile mills	0.8	0.57	0.39
314	Textile product mills	2.7	0.19	0.12
315	Apparel manufacturing	3.6	0.22	0.16
316	Leather and allied product	0.3	0.56	0.19
321	Wood product manufacturing	4.8	0.21	0.09
322	Paper manufacturing	1.5	0.48	0.06
323	Printing and related support	11.1	0.15	0.10
324	Petroleum and coal products	0.5	0.34	0.13
325	Chemical manufacturing	3.3	0.65	0.23
326	Plastics and rubber products	3.9	0.59	0.11
327	Nonmetallic mineral product	4.3	0.19	0.09
331	Primary metal manufacturing	1.5	0.58	0.31
332	Fabricated metal product	20.6	0.30	0.09
333	Machinery manufacturing	8.7	0.61	0.15
334	Computer and electronic product	3.9	0.75	0.28
335	Electrical equipment, appliance	1.7	0.70	0.47
336	Transportation equipment	3.4	0.57	0.16
337	Furniture and related product	6.5	0.16	0.14
339	Miscellaneous manufacturing	9.3	0.32	0.16
Aggregate manufacturing		100.0	0.35	0.17

Notes: Data are for 2007 and are for firms that appear in both the US Census of Manufactures and the LFTTD. Column 1 summarizes the distribution of manufacturing firms across three-digit NAICS manufacturing industries. Column 2 reports the share of firms in each industry that export. Firm exports are measured using customs information from LFTTD. Column 3 reports mean exports as a percent of total shipments across all firms that export in the noted industry. Percentages in column 1 need not sum exactly to 100 due to rounding.

Tabel 1 Firm Exporting Bernard et al (2018) p. 21

These results confirm the theory of that only some firms export, and as a total of US manufacturing firms 35% export. The fraction of exporting firms does vary and are in the range of 15% to 75%. A thing to notice here is the value of comparative advantage. I would say that the US has comparative advantage in high-skill and capital-intensive industries. It is seen if you compare the percent of firms and fraction of exporters between these industries. In example electrical equipment and computer and electronic products has a high level of export fraction while labour-intensive industries have a lower fraction of export, such as apparel manufacturing.

When they check for differences between exporters and non-exporters (firms) they find that exporters have 128% more employment, 172% more shipments, 33% higher value added per worker and 3% higher total factor productivity. When they add in industry fixed effects the differences are smaller, but significant. It is also shown that the differences do not only arise from firm size. When they control for employment and industry effects, they find statistically significant differences between exporters and non-exporters within the same industry. The limit with this model is that mainly focus on the differences in the firms' productivity and size, while the results imply that there exist differences in wages, capital per worker and skill per worker, where all of them are positive towards exporting firms.

While looking at the differences between importing and exporting firms, even though this is not the main topic under investigation, it helps to paint the picture of the composition of firms that participate in international trade. Importers does after all buy from exporters. Within the framework of use, importers follow the same self-selecting that exporters do.

TABLE 3
FIRM IMPORTING AND EXPORTING

NAICS	Industry	Percent of all firms (1)	Fraction of firms that export (2)	Fraction of firms that import (3)	Fraction of firms that import and export (4)
311	Food manufacturing	6.8	0.23	0.15	0.10
312	Beverage and tobacco product	0.9	0.30	0.18	0.11
313	Textile mills	0.8	0.57	0.44	0.37
314	Textile product mills	2.7	0.19	0.14	0.09
315	Apparel manufacturing	3.6	0.22	0.23	0.15
316	Leather and allied product	0.3	0.56	0.53	0.40
321	Wood product manufacturing	4.8	0.21	0.09	0.06
322	Paper manufacturing	1.5	0.48	0.25	0.21
323	Printing and related support	11.1	0.15	0.05	0.03
324	Petroleum and coal products	0.5	0.34	0.18	0.14
325	Chemical manufacturing	3.3	0.65	0.40	0.36
326	Plastics and rubber products	3.9	0.59	0.34	0.29
327	Nonmetallic mineral product	4.3	0.19	0.15	0.09
331	Primary metal manufacturing	1.5	0.58	0.32	0.29
332	Fabricated metal product	20.6	0.30	0.12	0.10
333	Machinery manufacturing	8.7	0.61	0.30	0.28
334	Computer and electronic product	3.9	0.75	0.50	0.47
335	Electrical equipment, appliance	1.7	0.70	0.46	0.41
336	Transportation equipment	3.4	0.57	0.35	0.31
337	Furniture and related product	6.5	0.16	0.12	0.07
339	Miscellaneous manufacturing	9.3	0.32	0.20	0.17
Aggregate manufacturing		100.0	0.35	0.20	0.16

Notes: Data are for 2007 and are for firms that appear in both the US Census of Manufactures and the LFTTD. Firm exports and imports are measured using customs information from LFTTD. Column 1 summarizes the distribution of manufacturing firms across three-digit NAICS industries. Remaining columns report the percent of firms in each industry that export, import and do both. Percentages in column 1 need not sum exactly to 100 due to rounding.

Tabel 2 Firm Importing and Exporting Bernard et al. 2018 p. 26

The results of importing firms are similar to the results regarding the ones that do export. 20% of all US manufactures import and 16% both import and export. There is great variation in between industries in all three columns (2-4), and Bernard et al. has a prediction to correlation between importing and exporting firms through 2 mechanisms. 1. Selection: More productive firms will find it profitable to incur the fixed costs for both importing and exporting. 2. Interdependence and complementaries between the firm margins of international participation. The two margins are extensive and intensive, extensive is the number of countries to/from which a firm export/import and the number of products the firm exports/imports to/from a given country, and intensive margin is exports/imports of a given product to/from a given country. When a firm decides to pay the fixed costs of exporting, the increased sales and profitability from also increases the profitability of incurring the fixed cost to import, and when a firm first incurs the fixed cost of importing, the resulting improvement in supplier access and reduction marginal costs increases the profitability of incurring the

fixed costs for exporting. The results show that the predictions of correlation between import and export exists across industries (Bernard et al 2018).

While we are having a look at both US import and export firms, it would also be useful to look at US firms' characteristics at for both exporters and importers, because it does give a better understanding of how well integrated the firms' operations are. From the Bernard (2018) article, I present a table with comparisons between exporters characteristic and importers characteristics, as well as characteristics for firms that do both.

TABLE 4
EXPORTER AND IMPORTER PREMIA

	Exporter premia (1)	Importer premia (2)	Exporter and importer premia (3)
log employment	1.11	1.20	1.39
log shipments	0.24	0.32	0.36
log value added per worker	0.21	0.25	0.28
log TFP	0.04	0.03	0.03
log wage	0.10	0.09	0.11
log capital per worker	0.20	0.28	0.34
log skill per worker	0.11	0.16	0.18

Notes: Data are for 2007 and are for firms that appear in both the US Census of Manufactures and the LFTTD. All results are from bivariate OLS regressions of a given firm characteristic on the dummy variable noted at the top of each column as well as industry fixed effects. All specifications except for employment also include firm employment as an additional control. Firm exports and imports are measured using customs information from LFTTD. Total factor productivity (TFP) is computed as in Caves et al. (1982). Capital and skill per worker are capital stock and non-production workers per total employment, respectively. All results are significant at the 1 percent level.

Tabel 3 Exporter and Importer Premia p.27 Bernard et al. 2018

As we understand from the table above, which also matched with their predictions, there are differences in performance between importers and non-exporters. The results in the columns (1-3) are the performance differences between the exporting firms and non-exporters, importers and non-importers, and the enhanced performance of firms that do both. All the results are controlled for industry fixed effects and the specifications except for employment control for firm size as measured by log employment. I have already mentioned the exporter premia earlier, so the focus here is the latter two columns. Importers have 120% more employment, 32% more shipment, 25% more value added per worker, 3% more total factor productivity, 9% higher wage, 28% higher capital per worker, and each worker possess 16% more skill compared to firms that are not importing.

The rise in performance is even greater when a firm does both operations, export and import. This again reflect the writers' assumption that competing on the international market on multiple margins amplifies their competitiveness and the differences in productivity between firms that do such operations vs. those who does not.
With this "conclusion" the difference in firm heterogeneity is only partly explained by export, and the import side of heterogeneity must also be explored as well as the side of both importing and exporting.

4.1 Heterogeneity and import

In the literature it is well established that there is a positive correlation between exports and firms' productivity and have cast some shadow on side of importing and productivity. Halpern et al. (2005) and Kasahara and Rodrigue (2008) find support for a high level of productivity among importers.

4.2 Extensive margins

As it has been well established, with Melitz' (2003) research there are productivity differences between exporters and non-exporters, and research within this framework have explored these differences further. Research such as Bernard et al 2018 do not think Meltiz' work goes far enough to explain the rise and "dominance" in the international economy by a few large firms, which of course has a more effective production, but they also possess other advantages across multiple extensive margins. They can by having a broader selection of goods compete in more markets and build their brand more efficiently. In example Yamaha produces motorcycles, speakers, and musical instruments.
When the price of an input increase in price they can cut back on production of that product and increase production of goods that is relatively cheaper option. By doing this, MNEs with more extensive margins can often make larger profits than firms who do not compete on the same level of extensive margins.

5 Summarizing Discussion

The purpose with this thesis was to understand which firms export, do FDI in the form of greenfield or M&A. After learning more about economies of scale and firm heterogeneity, it became clear to me how challenging it is to enter foreign markets as a small firm with only domestic sales. It is an important topic because we do see how a handful of large MNEs control huge market shares in their markets and operate with some sort of monopoly power,

thus harvest most of the available revenue. The debate about healthy competitive markets in the global economy should be more investigated, although it is hard to regulate for a "fairer" competition because countries that receive FDI often are interested in investments to grow their economy (Zhuang, 2016).

With Ricardian trade theory I explained the importance of comparative advantage and how a country should allocate labour into the sector it can most effectively produce goods. The Ricardo-Viner model explain the movement of labour from rural to urban areas, due to higher wage because of export. If we compare the Ricardo-Viner with today's reality, where we have seen rapid growth rate of urbanization, especially in south-eastern Asia in the last years (Zhuang, 2016), it does explain the movement of labour, because working in industry in urban areas pays better than farm work in the rural. South-east Asia is a desirable location of a production plant, even though the wages are higher in the urban area then in the rural are the wages much lower than in the home country. Locating a production facility here gives the MNE an advantage over its competitors that has production at home with higher wages.

Heckscher-Ohlin theorem explain that countries should export goods that are produced with factors the country is abundant with, labour or capital. Today we also see the same tendencies, capital-rich countries export capital-intensive goods and labour-rich countries export labour-intensive goods. Commodities that are cheaply produced and demand more labour are often located, by MNEs in areas with large populations, like south-east Asia. Goods that demand more capital are often produced in countries with more capital per worker, like Germany.
An effect of FDI on a country's population is the development of human capital in the host country. Zhuang, 2016 find evidence for an increase in human capital due to FDI and technology transfer.

These models do explain the location of production and export, but with a picture which is too simple to fully explain the mechanisms of export and FDI locations. These theories do not use economies of scale arising from internal attributes as a condition for trade. What I have discussed and shown with heterogeneity and monopolistic competition is that firms are different in what they produce and in productivity. The "best" firms will enter foreign markets, either through export or by FDI. The level of productivity or trade barriers have seemed to decide what form they choose. Firms that do decide to enter new markets must also acknowledge that they can be of a disadvantage to domestic firms, due to a liability of foreignness. This effect does vary from country to country but entering firms should have an

attribute that's special for only them to offset the liability of foreignness. LoF are more present when firms do horizontal FDI then vertical FDI, this is because a horizontal FDI is meant to target consumers and consumers may be unaware of your product or prefer a local substitute. Vertical FDI is meant to integrate new levels in a firm's value-chain, to be self-sufficient of an input needed for production or have control of their distribution network.

MNEs today are operating with more extensive margins than earlier and strategize their locations of production, sourcing countries, which inputs to integrate, which products to produce, which products to produce to each market, and which plants export to which market (Bernard 2018). A structure like this seems quite waterproof, and these MNEs notice only a small competition. In the way these organisations are constructed they can charge different markups in different markets, which makes a small entrant's competitiveness neglectable. If the MNE notices competition from an entrant, it can lower its prices and bleed out the entrant until it must exit the market.

Some firms cannot enter foreign markets, and that's it purely because of the costs, and they do not possess the level of productivity need to cover them (Melitz, 2003) Costs of transportation, investments in new plants, LoF, and more competition which means lower prices and markups (Melitz 2003) (Helpman et al. 2004). The investment to enter is the biggest deterrent, and instead of investing this sunk cost to compete with MNEs they focus on the domestic market where they have an existing demand.

5.1 Further research

To further research and analyses it would be interesting to look at the solidity of MNEs and how they have dealt with the corona pandemic. Because MNEs has operations in several countries, the corona pandemic could have had bigger consequences for them than for domestic firms that only need to relate to one country. Outsourcing inputs makes firms vulnerable to shocks like the pandemic, and it would be interesting to look at how firms adjust when on-time delivery of inputs is delayed in such scale.

Because of the difficult position of small firms, it would be interesting to look at the welfare changes that's created by the largest MNEs, to understand if it does create a better quality of life in countries that does have a large manufacturing sector, or if the owners keep the largest shares of profit for them self which could create larges economic differences. The results could be used as arguments for and against the concentration of revenue.

6 Conclusion

The thesis was set out to answer the question "what differentiates firms who export and/or do FDI from those who do not". To answer the question, I have explained classical theories with Ricardian trade theory where comparative advantage in production of a good is the drive for trade and Heckscher-Ohlin where differences in factor endowments are the drive. The new trade theory shifts the focus of trade towards differences within firms, and how they are more efficient in the production of goods compared to their counterparts in their industry or sector, as well as consumers' choice of differentiated goods.

Even though the subject has developed over the years, the classical models still have relevance today. Comparative advantage is very present when we look at a country's exported goods, and visible when we compare industries that require high-skilled labour, and capital-intensive industries with low-skilled labour and labour-intensive industries, and the goods' location of production. After reflecting over global trade in our times, most markets have some large firms with a significant market share, where these firms have the possibility to set different prices in each market. I think the most important part of this review is to understand how these firms grew, and that's more easily explained by new trade theory. Since it was published in 2003, Melitz' model is the model most research use as the underlying one. The model gives a good explanation of how firms face a more intensive competition under free trade, and how firms that enters the export market are more efficient in the production. The cheaper production creates the economic space needed to pay costs connected with overseas sales, only a portion of firms in a market can afford the costs due to heterogeneity in the production.

A firm's decision in how to gain access to a new market varies. This is either done through export, greenfield FDI and/or through mergers & acquisitions. An earlier assumption, which also comes out of firm heterogeneity, is that the most efficient firms do some form of FDI, and most likely greenfield. The group with the second to best efficiency does M&A and the third most export. This has some truth, although the largest firms often do some form of all three, and the form of market penetration vary conditioned by the degree of the firm's mobility in their different abilities, and the level of trade costs. The trade-off between proximity and concentration depends in the transportation costs, tariffs etc. Concentration gives firms the possibility to achieve economies of scale while proximity could form a more local relationship to the desired market.

An uncertainty with entering a foreign market is the liability of foreignness. Firms that decide to enter foreign markets should make sure of their ability to offset LoF in some way, either through their own production or look for an acquisition target with knowledge to the local market.

The main difference between firms with operations in foreign markets and those who don't, seems to be differences in costs of inputs and production, defined as firm's heterogeneity in the literature. Firms reduce their costs by sourcing inputs to low-cost countries by locating their plants in countries with low-cost labour, vertical integration, and price differentiation. New entrants will struggle to compete with established multinational enterprises, *which could lead to that free trade may lose its competitive integrity if only a few large MNEs in each industry control them.*

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