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Tracing

Trade *and*

Improving

Predictions

Why the Global Value Chain position of Dutch manufactory sectors matters in assessing the impacts of the Trans-Atlantic Trade and Investment Partnership (TTIP)

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Table of contents

Introduction

We are currently witnessing a time where the news is dominated by the negotiations of trade treaties. At the same time when long established free trade agreements such as the European Union and the Northern American Free Trade Agreement are under fire, new trade treaties are being negotiated. Some successfully concluded (e.g. CETA, EU-South Korea, EU-Vietnam), others delayed and (temporally) suspended (TTIP, TPP, RCEP).

The reason for this surge has been ascribed to the failed World Trade Organization's (WTO) Doha round (2001-2008/2013). The failure of the WTOs unilateral approach to trade liberalization was seen as a reaction of emerging and developing economies to the 'bad deal' at the Uruguay round (1986-1994) (Felbermayr & Larch, 2013; Hamilton & Blockmans, 2015; Matsushita, 2014). The influence of emerging countries in the WTO grew through the rise of the BRIICS (Brazil, Russia India, Indonesia, China, and South Africa) economies, and also, because of the diminishing power of the Western economies due to the economic crisis of 2008, which worsened their bargaining position in the WTO. This phase in global trade liberalization has been called as the post-Davos (Cassidy, 2016) or post-post-Cold War model (Hamilton & Blockmans, 2015). The surge in RTA negotiations could be the next period, however, public protest against TTIP and CETA, and recent elections and referendum results, has perhaps shown an implosion of this phase in the Western world.

The merits and demerits of TTIP has also been discussed by academics and policy researchers. There have been many econometric models that predicted the effects on TTIP. All (Aichele, Felbermayr & Heiland, 2014, 2016; Berden, Francois, Thelle, Wymenga & Tamminen, 2009; Felbermayr & Larch, 2013; Felbermayr, Heid, Larch & Yalcin, 2014; Fontagné, Gourdon, Jean, 2013; Rojas-Romagosa, 2016) but one (Capaldo, 2014) lead to positive conclusions.

A new generation of datasets, have spurred research on the functioning of trade, especially, of the functioning of Global Value Chains (GVCs). (For a discussion of these articles, see Ferrarini and Hummels (2014).) GVCs, as a term, was introduced by Porter (1986). It is a subcategory of international trade flows; The distinction is that a product has to have at least three production stages in at least two different countries, to qualify as part of the GVCs. The production of smartphones is a well-known example of a GVC.

Koopman (2012) developed a framework to analyze GVCs. His research shows that countries and sectors have different upstream (beginning of GVCs) and downstream (end of GVCs) positions. Just like trade flows are on itself an economic geographical phenomenon, I argue that the position of countries in the GVCs is a result of economic geography as well. Moreover, I argue that this position is a fundamentally important aspect of the impact of TTIP in the Netherlands.

In my first chapter, I am going to briefly discuss the developments of international trade theory. In my second chapter, I will discuss the type of models that are used in predicting the outcomes of TTIP, what distinguishes them, and critically analyze the shortcomings of this type of modelling. In my third chapter, I am going to show the Dutch position in the GVCs. Furthermore, I am going to discuss what explains this position, as well as discussing the impact of different GVC positions.

The data on manufactured sectors is divided in more subcategories than the agricultural or service sector. Besides this, production processes in manufactory sectors are relatively more fragmentized as well. Therefore, I will use the Dutch manufactory sector as a case study, and test the whether the GVC position of sectors, indeed matter when looking at imported US intermediates. Lastly, I will discuss the effects that TTIP will have on Dutch firms in the manufactory sector, that are participating in GVCs.

1. Development of international trade theories

In this chapter, I will give a brief overview of the most influential theories in explain international trade patterns by economists and geographers. I will start with the classical theories. After this, I will discuss the establishment of the neoclassical trade paradigm. This paradigm was challenged by the Leontief paradox, which led to alternative theories by geographers and economists alike. How did trade theory develop over time?

1.1 Classical trade theories

The first trade theory is ascribed to Adam Smith. In Smith's famous work, *the Wealth of Nations* (1776 [2005]), he argues that annual production, rather than capital accumulation, determines a nation's wealth. Smith argues that the highest output will not be reached by autarky, but trough free trade. The central concept is the idea of absolute advantage. The cost of production of certain goods are not equally distributed across the world. Countries should produce and export goods that they can produce cheaper, and should import goods that can be obtained in other countries for a lower price.

Smith's theory has been further advanced by Ricardo (2001 [1817]). Other than Smith's theory, Ricardo shows with his famous wine and cloth example that not even an absolute advantage is necessary. Ricardo compared the productivity of the two sectors between his country of birth, England, and the country of his family roots, Portugal. Even though in his example England is less productive than Portugal in both products, by only producing the goods with the lowest opportunity cost (i.e. the comparative advantage), not only England, but also Portugal would be able to reach a higher level of consumption. This is the key element of his theory: Every country, regardless of their productivity levels, benefits from trade.

The Ricardian model has been further adapted by John Stuart Mill (1848, in Maneschi, 1998) who expands on the division of gains. The Ricardo example shows that the total output will be increased if both nations specialize, but not how this extra output will be divided: Ricardo just simply assumed that the exchange ratio of cloth and wine would be equal to one. Mill extends on this. Mill argues that the exchange terms depend on the demand for the imported products. If English demand for imported wine was larger than the Portuguese demand for cloth, this would favor the Portuguese position. Mill further adds that once a country specializes, this would benefit the importing country, because eventually the total demand for a certain is reached, and the remaining supply would have to be sold at a lower price.

A final important expansion of the model is made by Alfred Marshall (1897, in Maneschi, 1998). Marshall critically looked at the supply side in Ricardo's model, which were fixed costs, namely the prices of labor per hour. Marshall argues that the average productivity was not stable, but would decrease: The law of diminishing returns. This could be due to a variety of reasons, for example labor laws or overcapacity.

1.2 Neoclassical trade theories

Differences in production costs were a given fact in the classical trade theories. Suggestion about the influence of fertility were raised as an explanation of variation in productivity, but this could only explain trade in agricultural goods. Eli Heckscher and Bertil Ohlin developed a theory, which would become one of the most important paradigms in international trade. The theory is that a nation's comparative advantage is based on the relative abundance of production factors, or the capital-labor ratio. So, a small, rich nation, would export capital intensive and labor extensive products, while, vice versa, a highly populated, poor nation, would export capital extensive and labor intensive products. This has become known as the Heckscher-Ohlin theorem.

In the 1940s, Samuelson mathematically worked out the Heckscher-Ohlin theorem. Samuelson formulized their ideas in a general equilibrium model. This model became known as the Heckscher-Ohlin-Samuelson (HOS) model. The assumptions of this model are perfect competition and factor mobility in all markets. The computability of models remained a central part in neoclassical economic theories.

While the model was popular and seemed logical, it became questioned when the theory was tested by Leontief (1954). Leontief looked at United States, the country with the largest relative factor abundance in capital, and looked at the nation's exports and imports with the rest of the world. From his analysis, it showed that the US exports more labor intensive products, and imports more capital intensive products. His research became known as the Leontief paradox.

1.3 Reactions to the Leontief paradox

Neoclassical economists clung onto the HOS theorem, by improving the assumptions. The exports of labor intensive products may be explained by the fact that the average labor productivity is relatively high in the United States. If you would measure the production in terms of labor hours, then this might overestimate the labor abundance in less labor productive countries. However, the Leontief Paradox, was not only empirically witnessed in the United States, but in other countries as well: The Netherlands trades with Germany, Ireland with the United Kingdom, and so on. It shows that the biggest trade partners of countries are not a complementary partner, but rather a very similar country.

One of the reasons that classical economists kept believing in the HOS-theorem, is that detailed data was not as available as it is today. It may be that a country both imports and exports electronics, but there is a difference between a relatively low and high tech product, that may fall under the same classification. This would mean that there is only parallel trade,

because of the low level of sectoral aggregation. However, when more disaggregated data became available, Grubel and Lloyd (1975) still witnessed that trade of similar goods between comparable countries was still very important.

A different approach is based on the catching-up process of technology. It starts with Hufbauers (1965) theory of two trade flow types: low wage trade and technological gap trade. A country that is leading in technology would dominate the market, but a low wage country can imitate the technology. Once it catches up, it has a comparative advantage, based on their lower wages. This argument was further elaborated by Vernon (1966), who established the well-known product-cycle model, where in three phases, the manufacturing of a certain product is outsourced from the country of origin, towards a country with lower wages.

The equilibrium models had a rather traditional view of utility: being able to own one car is good, being able to own two cars is even better. However, consumers don't only want to consume more, they also have 'love of variety', or a preference to choose between products. This argument was raised in the same year by Barker (1977, in Brakman & Heijdra, 2001). Barker argues that trade grows proportionally as income grows. This will enable consumers to choose. Some products may have little differences; maybe, the difference is non-existent, and only *perceived* by consumers. Still, the consumer likes to have the option to choose between products. Dixit and Stiglitz (1977, in Brakman & Heijdra, 2001) were the first to develop a formula for the love of variety argument. Since a lot of these options are foreign, this explains why similar nations trade with each other, and why intra-industry trade is so important.

This was the first step towards the formulation of the New Trade Theory. Central in this theory is monopolistic competition, and the idea that market structure, rather than comparative advantage, influences international trade. A different element of the new quantitative trade theory, is firm heterogeneity. Not every firm exports, but the ones that do, tend to be more efficient than the ones that don't (Melitz, 2003). This efficiency, or

competitiveness, can be explained by multiple factors. One being scale economies, others being exploiting agglomeration or location economies. Also, the structure of firms influence how firms can exploit these economies (Fujita et al., 1999; Porter, 1986). Firms that have a more downstream or consumer orientation, tend to follow the markets when relocating. Firms that have an upstream orientation (i.e. selling to other firms, not to consumers) will be looking more to the location of inputs. This analysis is an extension on the Weber model, where the optimal location of a firm is dependent on the location of inputs and markets, and the transport costs between these locations and the firm.

It does not mean that the neoclassical theories were completely off. Paul Krugman (1996), one of the main propagators of the New Trade Theory, acknowledges that trade in certain sectors is still determined largely by comparative advantage and perfect competition, for example resources and some agricultural products. But analyzing certain sectors with the love of variety element does provide a framework on which trade patterns can be better explained.

2. Literature survey of the predicted effects of TTIP

In the previous chapter, I have briefly discussed the development of international trade theories. These theories obviously play a huge role in the way economists try to model and predict trade flows. Firstly, I will discuss the type of models that are used in predicting the outcomes of TTIP, and what distinguishes them. It is important to understand how modelled assumptions can create differences in outcome, which I will discuss in 2.2. In 2.3, I will discuss in detail how comparative advantage still plays an important role in predicting which sectors will win, and which will lose – and discuss how this may lead to fundamental problems.

2.1 Type of predicting models

The two most important model types are Computational General Equilibrium (CGE) models, and Structural Gravity (SG) models. The CGE models were the traditional econometric tool to predict the effects of trade, and were developed following the HOS-theorem. The SG models were introduced a little over a decade ago, and rely on insights of the New Trade Theory (Anderson & Van Wincoop, 2003), as discussed in the previous chapter.

CGE models are more complex than the SG models. Apart from predicting trade changes, the CGE models also calculate the effects of the integration of economies on the output of sectors, the consumption on a household and per capita level, welfare gains, and the effects on employment, GDP, and public finances. SG models have a more limited aim; Besides bilateral trade flows, they can only account for GDP and welfare effects.

Because of this complexity, the data requirements for CGE analysis are more extensive. Also, because there are less fixed effects, a small shift in assumptions parameters highly influence the outcome. The advantage of the parsimonious SG models is that there is a possibility to structurally estimate some of the parameters, instead of just theoretically implementing them.

Because of the complexity, Bekkers and Rojas-Romagosa (2016) argue that broadly speaking, CGE modelling is done by policy research institutes, and SG models are done by academic researchers. The CGE models have been used by Fontagné et al (2013) and François et al. (2013), from respectively the *Centre for Economic Policy Research* (CEPR) and the *Centre d'Etudes Prospective et d'Informations Internationales* (CEPII). Especially the CEPR study is highly influential, as it was commissioned by the European Commission's Directorate General for Trade to independently research and predict the potential impacts of TTIP on EU-US trade. Structural Gravity models were done by Aichele et al. (2014, 2016), Carrere, Grujovic & Robert-Nicoud (2014), and Felbermayr et al. (2013). A different model is a hybrid

model, which combines some of the structural estimations from the SG, and implements them in a CGE setting. This has been done by Egger, Francois, Manchin and Nelson (2015) and Rojas-Romagosa (2016).

Furthermore, there is one alternative model that is used by Capaldo (2014). Capaldo's Keynesian demand driven model is the only model that gives unambiguous negative results for all countries in the European Union. Capaldo's research has been criticized by Erixon and Bauer (2015) for not being reproducible, for regarding trade as a zero-sum game and for having the unrealistic assumption that austerity measures implemented by various European countries, will continue for the coming decades.

2.2 Which assumptions influence the outcome

2.2.1 Factor mobility

When it comes to predicting the benefits of trade, one of the most important long term outcomes is the redistribution of production factors. SG models only include labor, while CGE models in addition also include capital. When the production factors are fully mobile, they can easily rearrange to more efficient sectors. However, production factors are not fully mobile, especially not labor.

Aichele et al. (2014) ignore this by assuming perfect mobility, and focus on a timespan where a new full-employment equilibrium is reached. This mechanism has been critiqued by Capaldo (2014), since full-employment is never reached. Felbermayr et al. (2013) tries to circumvent this by modelling in structural unemployment. However, by keeping labor fixed, it does not really say anything about the actual development of unemployment, only about the structural composition of employment (Rodrik, 2015).

Carrère et al. (2015) does include immobility of labor by looking at the effects of trade on sectors, and consequently looking at national labor market frictions. Re-allocation of labor can either be positive or negative for employment, depending whether labor moves from high

friction sectors to low friction sectors, or vice versa. This has also specifically for the Netherlands been done by Rojas-Romagosa et al. (2016). Rojas-Romagosa et al. (2016) argue that TTIP will lead to some job losses, but that these effects are only a small part of the natural job destruction process in the Netherlands.

The problem with labor market frictions on a national level, is that it only tells half of the story. When looking at a national level, there are fictional training costs, and searching costs: how long does it take to retrain in a different profession, and how long does it take to find employment in this sector. These may already be quite substantial. But besides this, there are also geographical costs of moving. Not every region will have an equal amount of job destruction and creation. Research has shown that the era of globalization may have converged the income of nations, but has increased the differences between the core and periphery within nations. These geographical costs and regional effects are not included in any studies.

When it comes to capital as a production factor, this is only included in CGE and hybrid models. The mobility of capital is modelled to flow to nations with the highest return on capital. When we look at inward FDI from the US in Europe, it primarily goes to countries with a similar capital stock and return on capital rates: The Netherlands, the United Kingdom, and Germany. Theories on FDI flows show that there can be diverse reasons that influence these flows, and return on capital is just one of many. The lacking predictions of FDI flows has been one of the critiques on the quality of hybrid and CGE-models, especially because capital flows are influencing the outcome (Aichele et al, 2016).

2.2.2 Preference erosion and spillover effects

A different outcome when a new PTA is signed, is preference erosion. This happens when decreasing barriers of trade makes it possible to buy goods and services from the partner economy, at the cost of existing relationships. Preference erosion will decrease demand for

products and goods from non-participating countries. Theoretically, this may disrupt the functioning of the free market, as this demand substitution does not necessarily has to be the result of actual differences in competitiveness. Furthermore, there may be a moral hazard;

Since the treaty is between the two most important Western economies, trade diversion may come at the expense of lower income countries, diverging the income of richer and developing countries.

However, preference erosion does not only affect third parties, but also affects intra-European trade. These effects are discussed by Aichele et al. (2014, 2016), Felbermayr et al. (2013), Fontagné et al. (2013) and Rojas-Romagosa (2016). Aichele et al. makes a distinction between upstream and downstream sectors, and shows that upstream sectors profit less in terms of value added exports. The authors argue that the reason for this is due to preference erosion, as European inputs are substituted for American inputs. In a broader sense, the effects of trade diversion are also discussed by Felbermayr et al. (2013) who predict that the peripheral EU member states will benefit more from TTIP, than the core countries, as their geographical advantage of being in the middle of the market, will mean less for the Trans-Atlantic trade relationship.

However, a PTA also may have beneficial effects for third parties. Firstly, third parties may profit when the Trans-Atlantic economy grows. Secondly, third parties can profit from direct and indirect spillover effects. There are direct spillovers for third countries that are members of the WTO, which occur when the US and the EU agree on deregulation and trade procedures; Other countries profit in return through the most-favored nation clause. Besides this, indirect spillovers may arise when third parties adopt the same trade standards that are negotiated in a Trans-Atlantic trade agreement, which in turn, will also benefit EU and US firms.

Some models have generous additional spillover effects included in their models. The CEPR study models these effects to have an extra 20 percent increase in trade. This magnifies the gains for the EU and the US, and downplays the negative effects for third parties. However, the spillover mechanism has been criticized by Felbermayr et al. (2013), as there is no empirical evidence that spillover effects occur after the adoption of a PTA. Moreover, regulatory agreements seem to be more reachable through mutual recognition of national standards, rather than coming with a new standard.

2.2.3 Market structure and the direction of trade

The way market structure is modelled also influences the outcome. Markets can be structured by the Eaton-Kortum or Armington perfect competition setting, or by a monopolistic competition setting. With perfect competition, products are easily substituted. With monopolistic competition, trade elasticity is at a lower setting, enabling intra-sectoral bilateral trade. For the welfare gains, the latter enhances the effects of trade, since consumers can buy a wider range of similar products. These gains are smaller when trade elasticity is average or high. For example, the Ricardian model of Aichele has lower welfare effects than the monopolistic competition based models that do include love of variety. In CGE models, the Armington assumption is leading, whilst in structural gravity models, this assumption can be eased (Costinot & Rodriguez-Clare, 2013)

As discussed in chapter 1.3, even though monopolistic competition helps understand trade flows better, it does not mean that price competition does not exist. Love of variety make sense for luxury goods, or services, it makes less sense for resources, or basic agricultural products.

When monopolistic competition is high, opportunistic behavior is low. The levels of opportunism differ between consumer goods, but also between firms. For example, McCann (2013) distinguishes three clusters of industrial relationships: pure agglomeration, industrial

complex, and social network. In the first type, firms are highly opportunistic, while in the other two, the relationships between firms are more stable. But even between firms that produce similar products, and operate in a similar industrial cluster, the characteristics of relationships can differ.

2.2.4 Estimations of tariffs and NTMs

A highly influential parameter is the number of tariffs and non-tariff measures (NTMs) that are currently implemented, and how much of it can be reduced by the PTA. Since the data is precisely monitored by the customs authority, there are official statistics available. Therefore, the estimation of tariffs, expressed as an Ad-Valorem Equivalent (AVE), does not vary much between models. However, that does not mean that the AVEs are corresponding correctly with the given products. Firstly, not all tariffs are expressed in AVEs: In the European Union, some products, like apples and banana's, have a set price per 100 kg. In the models, tariffs are expressed in a weighted AVE, by looking at the tariff income per product group, and dividing it by the total import value of the products. Secondly, there are big differences between products on various levels of aggregation. For example, the AVE on tobacco is 16,6%, for water-pipe tobacco, however, it is 74,9% (WTO, 2016). When the effects of a trade agreement are studied, the weighted average AVE may vary from the specific products' AVE. This means, that in a scenario where tariffs are almost fully repealed, it may have an exaggerated effect on lower than weighed average products' AVEs, and an underestimated effect on higher than weighted average AVEs.

For NTMs, this is less clear. NTMs are regulations that distort trade, but are not tariffs. Some may be part of legitimate policy goals, like preventing imports of products that are a risk for public health, or regulations such as mandatory testing of safety of cars. However, they can also be questionable, such as a set sizes of bottles. The costs of a foreign company to comply with these regulations, are set as an AVE. All (pure) CGE models are based on

bottom-up estimates. The most widely-used estimations from Berden et al. (2009) study, based on literature reviews, business surveys, econometric analyses, and consultations with regulators and sector exports.

The SG models enable top-down estimations by structurally estimating parameters for NTMs and tariffs. Felbermayr et al (2013) estimate the influence of tariffs and NTMs is derived by a coefficient, based on the average of 85 studies as calculated by Cipollina and Salvatici (2010), which is almost exclusively based research on intra-European, intra-Asian, and intra-American countries, with the only exceptions of the US-Israel treaty of 1985. Furthermore, almost all RTAs were signed during a timespan that lasted from the 1980s until the pre-crisis years (i.e. the most rapid expansion of world trade). The correct representation of this coefficient for the Trans-Atlantic case is highly questionable, as EU-US have already linked their economies through decades of lowering trade barriers. This means that a structural estimation based on this coefficient, will likely overestimates the size of existing tariffs and NTMs for the Trans-Atlantic case.

2.3 The problems of competitiveness measures based on comparative advantage

The goal of trade liberalization is reach a more effective distribution of resources. In 2.2, I have discussed the multiple factors that influence the pace of factor distribution, and subsequently, the gains of trade. Obviously, certain winners and losers have to be chosen. To determine competitiveness, the models use the Revealed Comparative Advantage index, based on the calculation provided by Balassa (1965).

Simplified, it can be written as:

$$BRCA(ij) = \frac{Xij}{Xi} / \frac{Xaj}{Xa}$$

Where the Revealed Comparative Advantage of a country's sector $BRCA(ij)$ is calculated as the share of country i export as compared with the total exports of country , divided by the

share of total exports of sector j in total global exports Xa, or in the case of TTIP studies, as the total Trans-Atlantic economy.

The interpretation is that when this index is higher than 1, the exports of a specific sector in a country is higher than as would be expected given the sectors stake in in the partnering or global economy. The intuition is that if this is the case, this sector must be more advantageous in this economy, than it is in the partnering economy. When it is smaller than 1, it is comparatively disadvantageous. When countries liberalize, a nation will increasingly become a net exporter of an advantageous sectors, and an increasingly net importer in a comparative disadvantageous sectors.

However, this line of reasoning became under attack. First of all, because we don't know how much of the trade is distorted by government policies, either in the role of subsidized production or protectionist measures. In the CGE and SG models, these effects are therefore adjusted for NTMs and tariffs. Secondly, Hoen and Oosterhaven (2001) show that both the number of countries, and the level of aggregation influence the outcome of the BRCA index. Also, there is little to say about how strong a comparative advantage is, as there is no upper bound. Therefore, Hoen and Oosterhaven (2001) question the BRCA validity when making cross country and cross time comparisons. At most, they argue, the BRCA can rank the comparative advantages of various countries, although this raises questions on the exact distance between ranks.

Recently, an alternative calculation of RCA has been presented by Yu et al. (2009). It is calculated as:

$$\mathrm{NRCA(ij)} = \frac{\mathrm{Xij}}{\mathrm{Xa}} - \frac{Xaj * Xi}{Xa * Xa}$$

The NRCA index overcomes the scale and aggregation problems of the BRCA index, and also, gives an ultimate lower bound of -¼ and an upper bound of ¼, where a positive

value indicates a comparative advantage, and a negative values means a comparative disadvantage. In a comparison of RCA indices, Deb and Hauk (2015) argue that the NRCA index is the most reliable tool when comparing differences in RCA on the level of sectors, cross-country, and over time. This has also been shown by Sanidas and Shin (2011) where the NRCA explained the highest variation in East Asian trade flows, compared to five other RCA variations, including the Balassa method.

But even the NRCA can still lead to misleading conclusions, when the wrong data is used. Basing comparative advantage on gross trade flows, leads to the problem of double counting by recursive trade flows (Koopman, 2012). When an intermediate product is imported and exported again, it exaggerates the value of the imported product's industry in a country's export. This problem is overcome by looking at Value Added trade flows, which only focuses on what is actually produced in a country. Brakman & Van Marrewijk (2015) have also shown that RCA based estimations based on Gross Value Added flows provide a better indication than Gross Trade flows. In table 1, you can see how gross trade and value added data and the used index leads to different results in comparative advantages.

Table 1. Change in comparative advantage in Dutch sectors, based on data and measurement

Year = 2011	Mining and quarrying	Chemicals and chemical products	Manufacturing nec; recycling	Electricity, gas and water supply	Wholesale and retail trade; repairs	R&D and other business activities
NRCA (DVA)	**0,002698**	-0,000570	**0,000075**	**0,000023**	**0,000300**	**0,000681**
BRCA (DVA)	**3,2701105**	**1,1174341**	0,8460302	0,8468278	**1,1231338**	0,9957095
BRCA (GX)	0,5848669	**1,2969876**	0,5546349	0,4396574	0,946565	**1,283871**

Table 1: Source: Own calculations. Data: TIVA dataset (OECD-WTO) Green = comparative advantage.

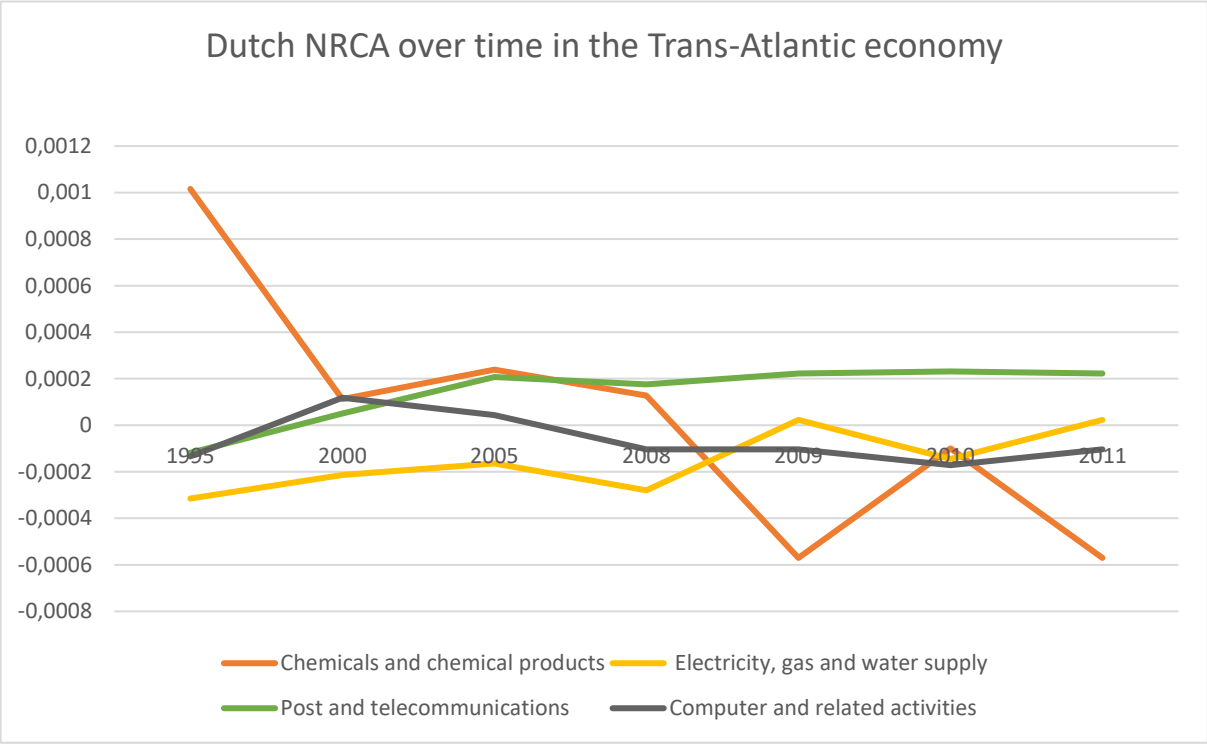


Figure 1 Source: own calculations, based on TIVA database (For reasons of clarity, only four sectors are shown)

Furthermore, when Dutch NRCA is compared over time, it becomes clear that comparatively advantageous sectors do not automatically increase their market share, or vice versa. From the 28 sectors I have calculated the NRCA from, 9 sectors change their competitiveness status at least once in the period from 1995-2011 (as can be seen in figure 1). As the comparative advantage status is not stable over time, this is troublesome for the TTIP studies, that often has a timespan that doubles the period I have analyzed.

Baldwin and Evenett (2012) argue that comparative advantage is not a valuable predictor for the effects of liberalization, even though many ex ante analysis and policy decisions are based on this. They start their analysis with a distinction between two 'unbundlings', or periods, of globalization. The first unbundling was based on lower trade costs: steam powered transportation made it possible to have production and consumption further separated. This enabled exploits of differences in endowments and scale economies. During this phase, nations did more or less trade according to their comparative advantage.

However, we are currently in the second phase. The second unbundling happened when coordination costs fall due to the ICT revolution. This made it possible for firms to fragmentize production. Therefore, Baldwin and Evenett (2012) argue that the development of trade flows is less dependent on sectors, as it is on tasks. Their argument is that having a comparative advantage based on sectoral level, will not mean that some tasks in the production of that sector won't be outsourced. At the same time, it may also mean that for a sector with a comparative disadvantage, employment may grow, as certain tasks are centered in the country. Timmer, Los, Stehrer and De Vries (2013) also call for a new measure of competitiveness, since market share based indicators are becoming increasingly less informative.

Also, because of the fragmentation of production, comparative advantage is not solely national, but also depend on what is produced in your vicinity, and the regional links you have outside your country. This phenomenon has also been called "borrowed size", and has been described as a more important influence on production that the actual size-related agglomeration effects of a country or urban region (McCann & Acs, 2011). When a company has access to more competitive inputs, it borrows competitiveness. At the same time, when it supplies their product as an intermediate downstream, it can profit from firms that have competitiveness in downstream tasks. Therefore, firms can profit from competitiveness resulting from locational, agglomeration and scale economies that are outside of their own region.

Beside the problems regarding the RCA as a predictor of the direction of trade in econometric models, there is also the problem of fixed input-output relationships. As Koopman et al. (2012) show, the GTAP database, as used in most econometric analysis, models firms' behavior based on price competition in final products. Since there is no separation of intermediate goods and final goods, there are no substitution effects in

composition of where intermediate products come from. The models can predict substitution based on final goods, but the models can't predict the substitution of intermediate inputs.

To give an example of how these relationships are fixed: Let's say the German automotive industry has a comparative advantage versus the US' automotive industry, but a supplier, say Dutch navigation systems, does not. Since the input output relations are fixed, there is no opportunity for the German automotive sectors to substitute these inputs for US inputs, which they may decide to do.

These dynamic effects can't be modelled, since they are hard to predict. There is also ground to ignore these effects, as trade in intermediate products only accounts for about 8-16% of total trade flows (Baldwin and Lopez-Gonzales, 2012). However, fragmentation of production is becoming more important, and the effects of trade liberalization on the distribution and specialization of tasks, are deemed as being more important than the effects on final sector output. By lowering tariffs and NTMs, this also paves the way for a deeper integration of trans-Atlantic production networks.

2.4 The predicted effect on Trans-Atlantic trade flows

There are 10 studies that I have mentioned in the previous subchapter, although not all studies mention the effects on bilateral trade between the EU and the US: Carrere et al. (2015) focus on employment, while Egger et al. (2015) tries to estimate the effects of NTMs and tariffs. The questionable model of Capaldo does not discuss the effects of trade on a continental level, but only on a global level. The other models that do mention the effects on trade, are shown in table 2.

Summarized effects on trade flows (in %)	EU to US	US to EU	Intra-EU
Aichele, et al. (2014)	171*	212*	-5,0
Aichele, et al. (2016)	55	59	-0,4
Felbermayr et al./Bertelsmann (2013)**	60/93	60/93	-23/-45
Felbermayr and Larch (2013)	79		
Fontagné, et al./CEPII (2013)	49	53	-1,2
Francois, et al./CEPR (2013)***	16/28	23/37	
Rojas-Romagosa/CPB (2016)	111	119	-3,2

*Table 2 Result of TTIP studies. * = EU without Germany . ** Effects are minimums and maximums. *** based on a prudent and ambitious scenario.*

Unsurprisingly, the studies find a positive effect of TTIP on trans-Atlantic trade flows. Most studies tend to see the effect to be stronger on US-EU trade than vice versa, although it does not differ much. There is consensus that the sector effects are the largest in the agricultural sector and lowest on the service sector. The studies that discuss intra-European trade effects find it to have a negative effect of between -0.4 and up to -23 to -45 percent in the Felbermayr study. Rojas-Romagosa predicts the trade effects of TTIP for Dutch exports to the EU to decrease with 2 percent, and total intra-EU trade to decrease with 3.2 percent.

The studies that compare the effects on different European countries, conclude that the countries already trading a lot with the US, will comparatively profit less (Felbermayr, 2013) Also, Rojas-Romagosa shows that Dutch bilateral trade flows with the US is lower than EU average. Aichele et al. (2014, 2016) argues that countries in the European core had an advantage when trading with other European countries, but TTIP diminishes this advantage.

Even though there are some assumptions that may not be fully accurate, such as market structure and the height of tariffs, it is understandable that certain abstractions must be made to give a sensible prediction of what is likely to happen. However, I have shown that it is

highly questionable to which regard the BRCA can predict the directions of trade, and if this isn't an outdated indicator in the current phase of globalization. Fragmentized production may be a relative small factor in global trade, recent history has shown that it is gradually becoming more important, and a Trans-Atlantic trade treaty may further enhance the magnitude of trade in intermediate products and spur the fragmentation of production.

In my next chapter, I will research these GVC flows, and try to understand them better.

3. The functioning of GVCs

As discussed at the end of the previous chapter, the fragmentation slowly increases its importance in global trade flows. Yet, the trade flows of intermediate products, can't be modelled sufficiently. I argue in this chapter, that these trade flows matter in predicting the effects of TTIP, especially for the Netherlands.

Firstly, I am going to discuss a framework based on the combination of works of Koopman (2012), and Fally (2011) which I will use to analyze the Dutch position in the GVC. Like trade flows have their own geography, I will explain that the GVC participation and position of countries and sectors have a distinct geography, too. Secondly, I will discuss the explanations of the functioning of GVCs in the literature, by looking at what determines the fragmentation of production, and the position of firms in GVCs, and if countries profit from their position. Lastly, by running a multivariate linear regression, I show that the GVC positioning matters in predicting trade flows of intermediate products from the United States, imported by European manufactory sectors.

3.1 The Dutch position in GVC networks

Most literature that research GVCs has been recently published. The reason for this, is that there is a new generation of datasets, that enables researchers to do analyze these trade flows. As discussed, the often used GTAP-database couldn't analysis flows in intermediate products, since it did not make a distinction between intermediate products and final goods. Based on data from The World Input Output Database (WIOD) developed by the University of Groningen, a joint OECD and WTO initiative led to Trade in Value Added (TIVA) Database.

Koopman, et al. (2012) has provided two important metrics in order to analyze GVC. The first metric is the participation of countries in the Global Value Chains, and is calculated as follows:

$$GVCpart\ (c) = \frac{Foreign\ Value\ Added}{Gross\ exports\ c} + \frac{Domestic\ Value\ Added\ c}{Foreign\ Exports}$$

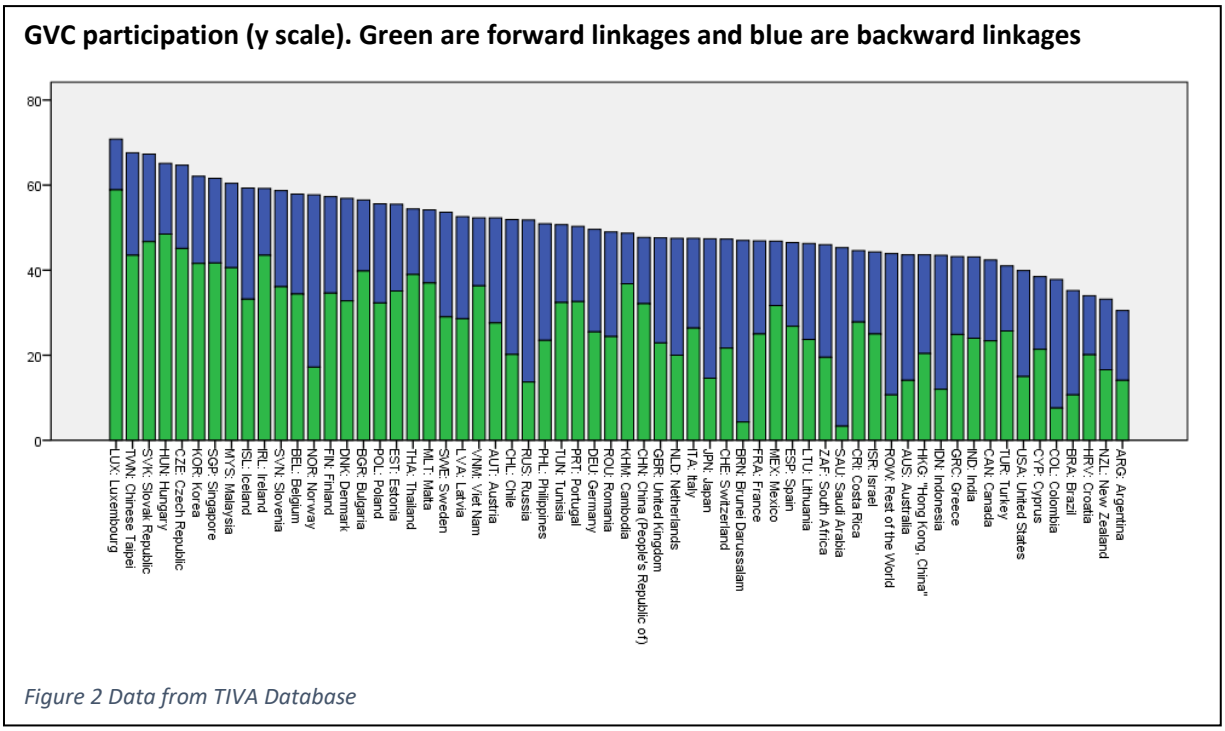


Figure 2 Data from TIVA Database

Countries can participate in Global Value Chains in two ways: through forward and backward linkages. The forward linkages are calculated by looking at the foreign value added

embodied in a countries export. The higher this is, the more a country is dependent on foreign exports, and the more downstream the exporting production is. The backward linkages are the domestic value added, embodied in the exports of other countries. This means that firms in a country are provide intermediates for foreign firms, that subsequently exports them again. The higher this is, the more upstream a country is. For both variables holds, that it only counts for GVC participation, when a product crosses a border with a minimum of two times. By adding the forward and the backward participation, the total GVC participation can be derived.

Figure 2 shows that the GVC participation of the Netherlands is below the median value of the countries with available data. These are the OECD countries, plus 26 extra countries. At the highest level, we see small countries like Luxemburg, Taiwan, and Slovakia. At the lower level, we see a country with a high protectionist tradition, Argentina, and a country with a relative isolated position, New Zealand.

Related to this index, is the GVC position, which measures the relative upstream and downstream position as:

$$GVCpos(c,j) = Ln(1 + Backward\ participation) - Ln(1 + Forward\ participation)$$

The GVC position can be measured on a country basis, but also on a sectoral basis. When the index takes a positive value, the GVC position of a country c or sector j is relatively more upstream. The natural logarithm is used so that the relative upstream or downstream position prevents high outliers due to a denominator effect.

The backward/forward and downstream/upstream dichotomies are related, but not fully interchangeable. Backward linkages are the origin of a firm's inputs. Forward linkages are where the firm's outputs are going. In the GVCs, an upstream position means that the firm is at the beginning of the production process. A downstream position would mean that the firm is closer to the point where the product is sold. Backward linkages take a high value for

firms that are downstream, since they are generally provided by upstream firms. When a firm has high forward linkages, it means the firms output are intermediates which are further processed by firms that are more downstream.

Figure 3 provides a visual view of the GVC position of countries. The EU countries tend to be in the mixed economy, or downstream. The only European countries that are relatively upstream are non-EU Norway and Russia, and the Netherlands.

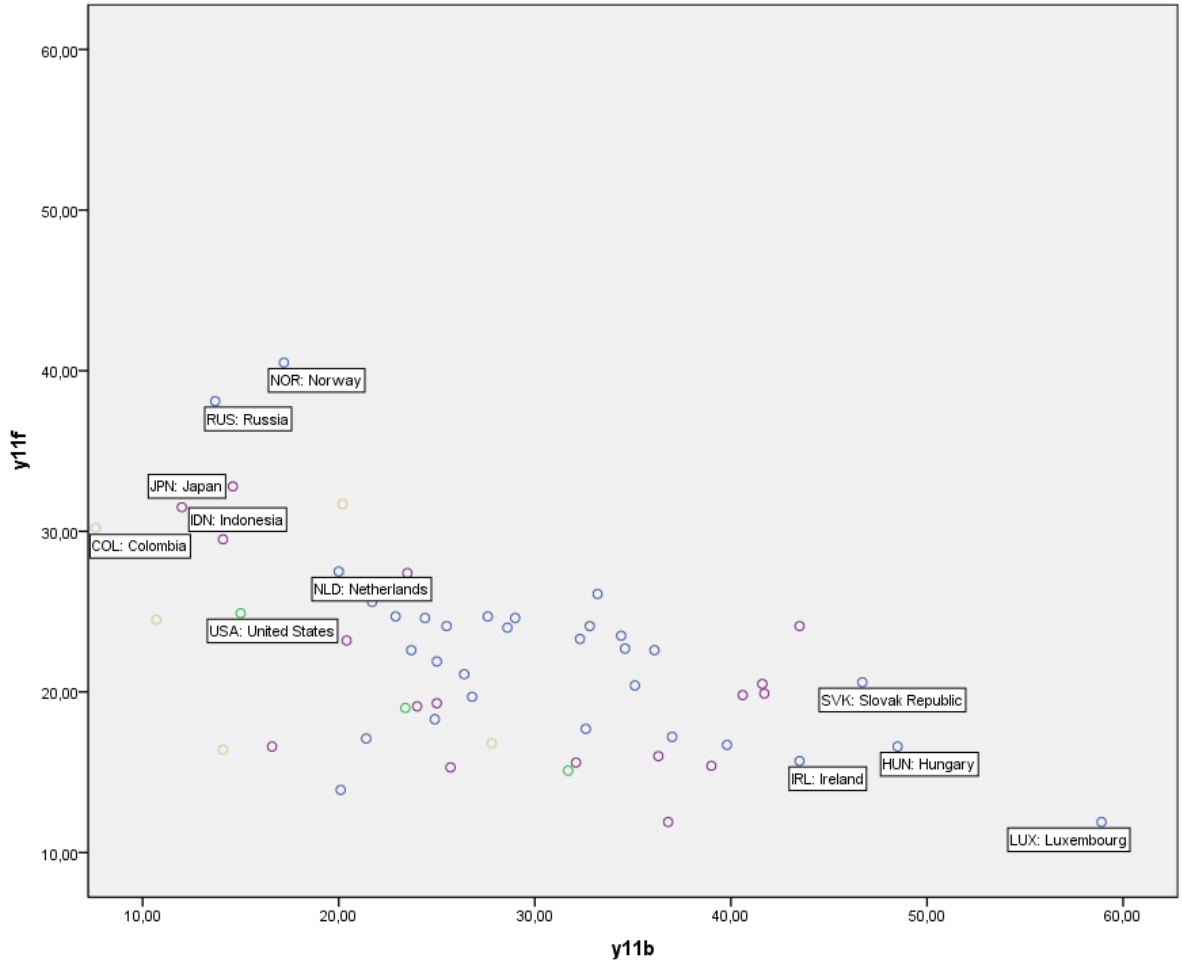


Figure 3 The upstream position (y-axis), and the downstream position (x-axis). Blue countries are European. Based on TIVA Database

Figure 4 shows the bilateral trade relationships of the Netherlands. It shows a pattern that could be expected when compared with figure 3: most countries are on the right side of the origin line, which means that the Netherlands has a relatively more downstream bilateral orientation with this country. As the Netherlands has an upstream position, most countries are

on the right or downstream side. The countries where The Netherlands has a relative upstream relationship with, are the countries that are also more upstream: The United States, Russia and Norway, with the curious exception of the UK.

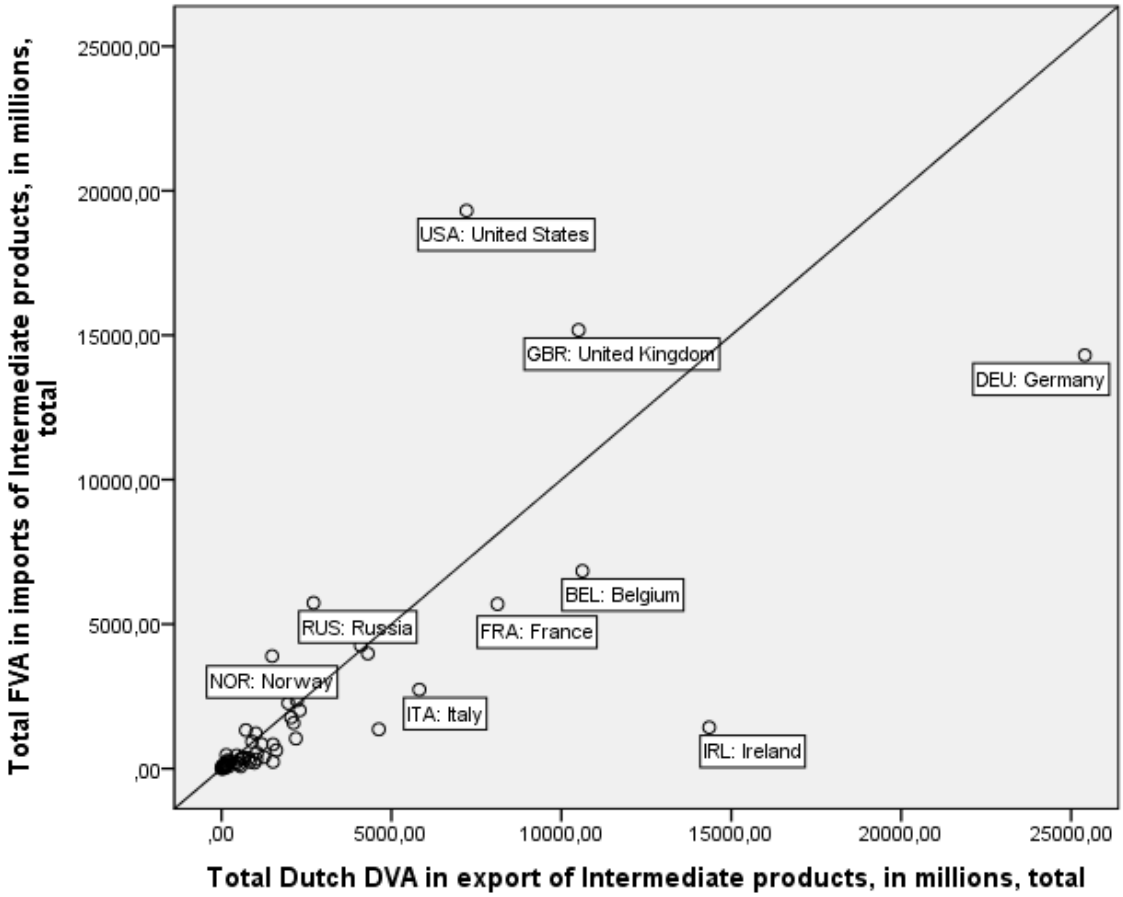


Figure 4 Own calculations. Based on TIVA Database

Not every sector is equally fragmentized. When we think of GVC, often the example of the production of smartphones comes to mind, but of course not every product is made this way. The difference in the fragmentation of sectors is calculated by the Length of GVC indicator, as introduced by Fally (2011). Based on input-output tables, Fally measures the fragmentation of production in sectors. The minimum value is 1, which would mean that there is only one-stage production in a sector. It increases when more intermediate inputs, whether inter or intra-sectoral, are added to the production process.

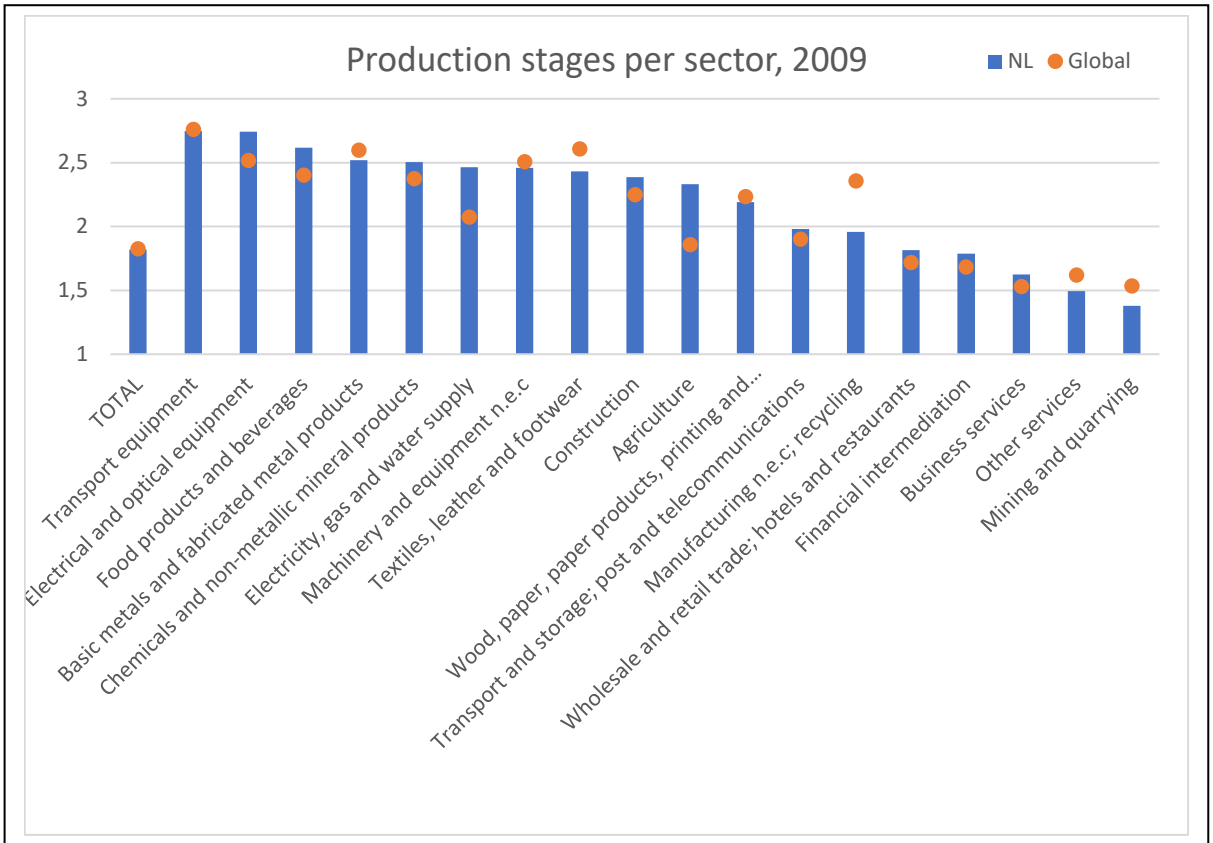


Figure 5 Data source: OECD Global Value Chains - indicators (2013)

Two conclusions can be derived from this graph. One, that Dutch sectors have more or less the same production stage pattern as compared with a global level. Second, that the mining and service sectors are less fragmented than the manufactory sector.

3.2 Theoretical explanations of the functioning of the GVCs

3.2.1 Why are some sectors more fragmentized than others

The reason why some sectors are more fragmentized that others, is explained by Baldwin and Venables (2010). Their article is based on the centripetal/centrifugal dichotomy of the famous article Venables co-authored with Krugman (1990), where agglomeration is either stimulated by centripetal forces, and undermined by centrifugal forces. Baldwin and Venables (2010) use this dichotomy to explain the fragmentation of production.

The centripetal forces are based on coordination, management and transport costs. It is cheaper to have all the production in one place, since it saves on shipping, and on coordinating production in different facilities. Also, different production facilities will lead to relatively more management costs. When trade costs fall, the amount of stages increase, it decreases the average size of production stages, and increase the amount of trade that crosses the border, in gross trade terms, at least. Tariffs and NTMs have a 'gluing' or centripetal effect on the fragmentation of production, as it leads to higher trade costs. Also, the differences in factor intensities have a centrifugal effect, since when these factor intensities rise, it becomes more lucrative to outsource production towards a different location.

But not for every sector and firm, these forces will count equally. Not every firm will reach a scale level on which it can fragmentize production in different sectors. Also, the transport costs for certain products will make it very hard to fragmentize production. Baldwin and Venables (2010) explain this by the analogy of snakes and spiders. Snakes are products that move in a linear way through the production chain. An example for this are electronics. Spiders are production process like the ones in the automotive sector. Here productions come from different spokes, but come together in a final assembly sector.

3.2.2 What influences a countries GVC position

As could be seen in figure 3, most countries are in a mixed position, where they are neither distinctively forward oriented, nor backward. For most European Union countries (the blue dots), this is true as well, although there are some downstream countries, like Slovakia, Hungary, Ireland and Luxembourg. The Netherlands has a relative upstream position; compared to other EU member states, it is the most upstream oriented. The United States also has an upstream position.

The factors that underlie a country's position in the GVC is not clear cut (Lejour et al., 2012), but there are some explanations about what influences countries' position in the Global

Value Chains. First of all, in the top left, you can identify natural resource exporting countries, such as Norway, Russia, Colombia and Indonesia. This relationship has been discussed by authors such as Duprez and Dresse (2013) and Baldwin and Lopez-Gonzalez (2015). These sectors are upstream, as they provide inputs for other sectors. However, Japan is also at an upstream position, which is not a large resource exporting country. For the Netherlands, the same thing is true: exports in metals and minerals hardly play a role in the total domestic value added in foreign exports. Most domestic value added in mineral resources that is exported from the Netherlands goes to Belgium, and is not exported again but consumed there, so it does not influence the Dutch upstream position.

A country's export portfolio may influence their upstream and downstream position, but when you compare the GVC position of the Netherlands with the United States and Germany, you see that Dutch and American sectors are often more upstream than their German counterparts. Figure 6 shows this trend. So apart from the fact that mineral exports in GVC participation plays a small role, the manufactural sectors are generally more upstream in the Netherlands.

A different explanation is provided by Baldwin and Lopez-Gonzales (2015), who argue that bigger countries can be supplied easier by the home market. In econometric analysis, the Helpman-Krugman (1985) assumption assumes that a nation uses its own intermediates, as part of its GDP's share in global production. Baldwin and Lopez Gonzales (2010) show that this is highly exaggerated. Even the United States would import almost three quarter of its intermediates, whilst globally this is between 8-16 percent. Even though the Helpman-Krugman assumption is exaggerated, it does seem to give an explanation why the United States and Japan have a comparatively low foreign value added in their domestic exports.

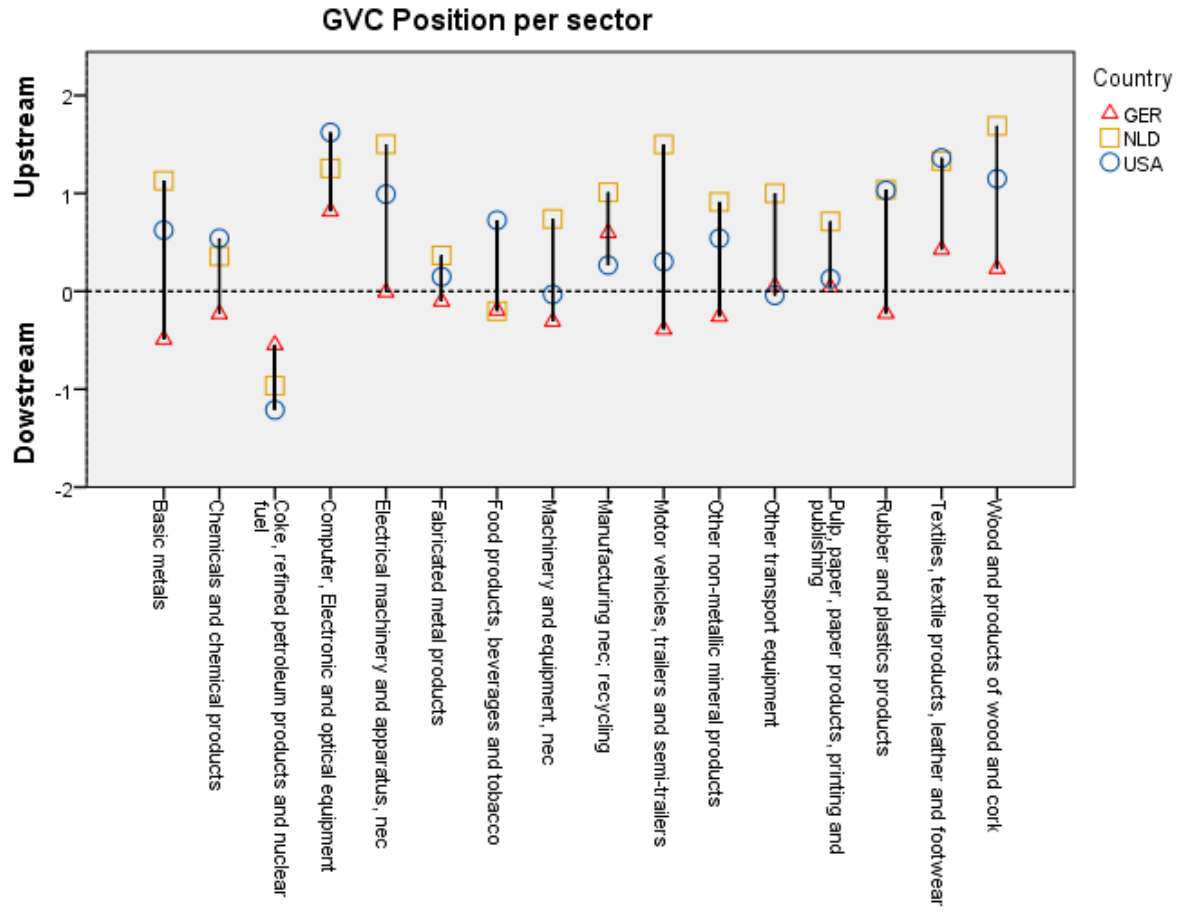


Figure 6 Own calculations. Based on TIVA database

Institutions also play a role. As explained by Douglas North (1990), institutions can be soft or hard. The former being cultural, the latter codified – although the two influence each other. Hard institutions explain the upstream and downstream position of respectively Japan and Ireland. Japan is known for restricting market access to foreign firms (Lejour et al., 2012), making it more logical that Japanese firms tend to orientate outward, and don't have large foreign inputs in their exports. Alternatively, Ireland is an example of the opposite, being open to foreign investments, and having a beneficial tax regime, which made it an interesting place for foreign companies to place downstream stage production and distribution operations, from which final products to the European market could be sold. Then again, on an institutional basis, the Netherlands looks much more like Ireland than Japan, so that also does not explain the Dutch position.

Soft institutions may provide a more suitable explanation. Smaller countries often need to adapt to the wishes of bigger markets. This led the Irish in opening their economy for foreign investment. The Netherlands have a long tradition of being global, and may be comparatively more flexible. There are cultural costs of trading, also in the sense of coordination costs, as they are explained by Baldwin and Venables (2010), so it makes sense that countries that are more open towards different cultures participate more in GVC.

A different, and maybe more fitting explanation can be derived from a simple Weberian framework, as already mentioned in chapter 1.3. The ideal location of firms is where the transport cost from inputs and the transport costs to the market can be minimalized. The Netherlands is a port economy, where inputs often can be acquired at a more competitive rate than for example the landlocked countries of Slovakia, the Czech Republic, Hungary, and Luxemburg, giving Dutch firms an incentive to specialize at tasks of the beginning of GVCs. Either through conscious strategic decision making, or by natural selection, the Dutch economy now has a unique position as a European supplier in the GVCs.

However, the same argument (smallness, adaptability, and port economy) can be made for the Belgium and Irish economy, which do not have this upstream position. The Irish position may be explained by policy decisions, or a relative longer distance from European production hubs like Germany. However, this is not the case for Belgium, since the country has a similar geographical location, a similar economy size, and also culturally adaptability (perhaps as a trilingual country even more so than the Netherlands) and an important port as well. So, the theory is not definite.

3.2.3 What is better?

Although there are many theories about what influences the position of countries to be upstream or downstream, or why certain sectors are more fragmentized than others, it is unknown which position is preferable for a country. As could be seen in figure 3, there are rich and poor countries upstream (USA, the Netherlands versus Russia and Brunei) and downstream (Luxemburg, Ireland versus Cambodia and Hungary). One of the reasons for this, is that there can be relatively high value added tasks at the beginning and the end, such as R&D and branding at upstream locations, and marketing and sales at downstream locations (Porter, 1986).

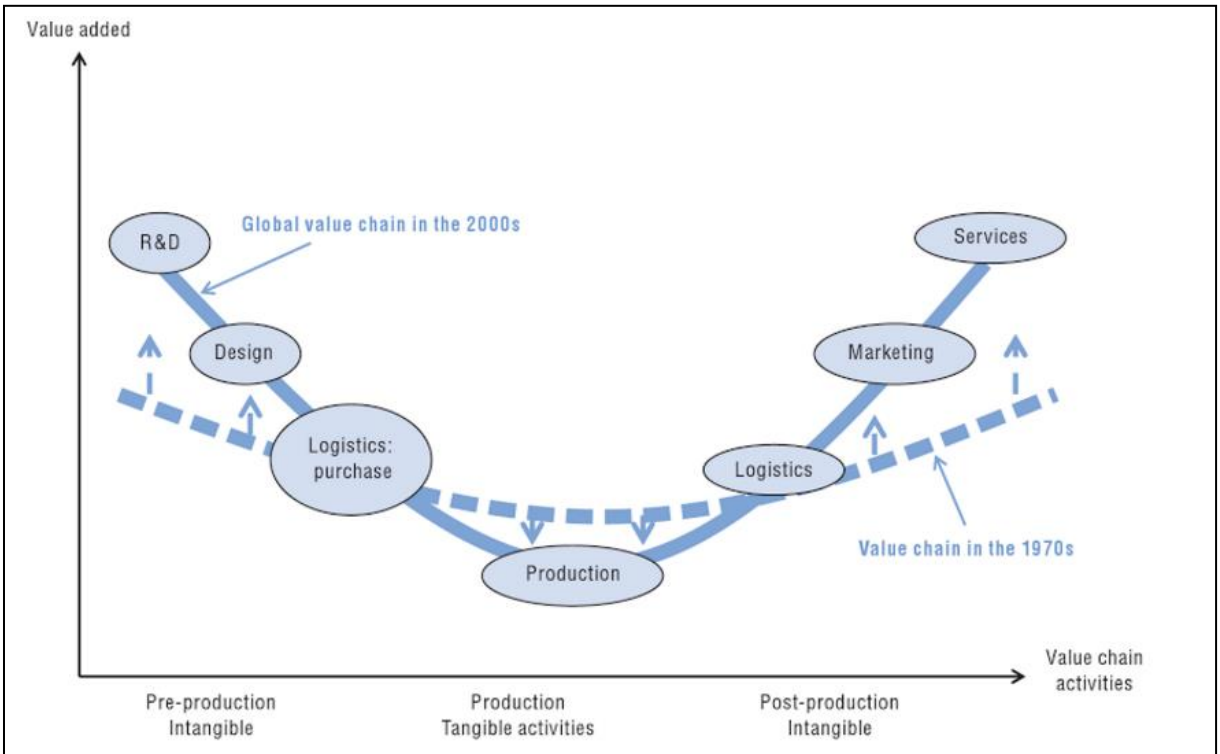


Figure 7 Source: OECD (2013), based on Baldwin (2012). Baldwin (2012) argues that the U-line from the smile curve is deepening, as low value added tasks are offshored

Even though the TIVA database has already explained more than traditional data on the aspect of fragmentation of trade, it does not include the effects of where the profits go. There is a dichotomy of headquarter economies, and factory economies (Baldwin and Lopez-Gonzales, 2015). Intuitively, money gets repatriated towards the headquarter economies.

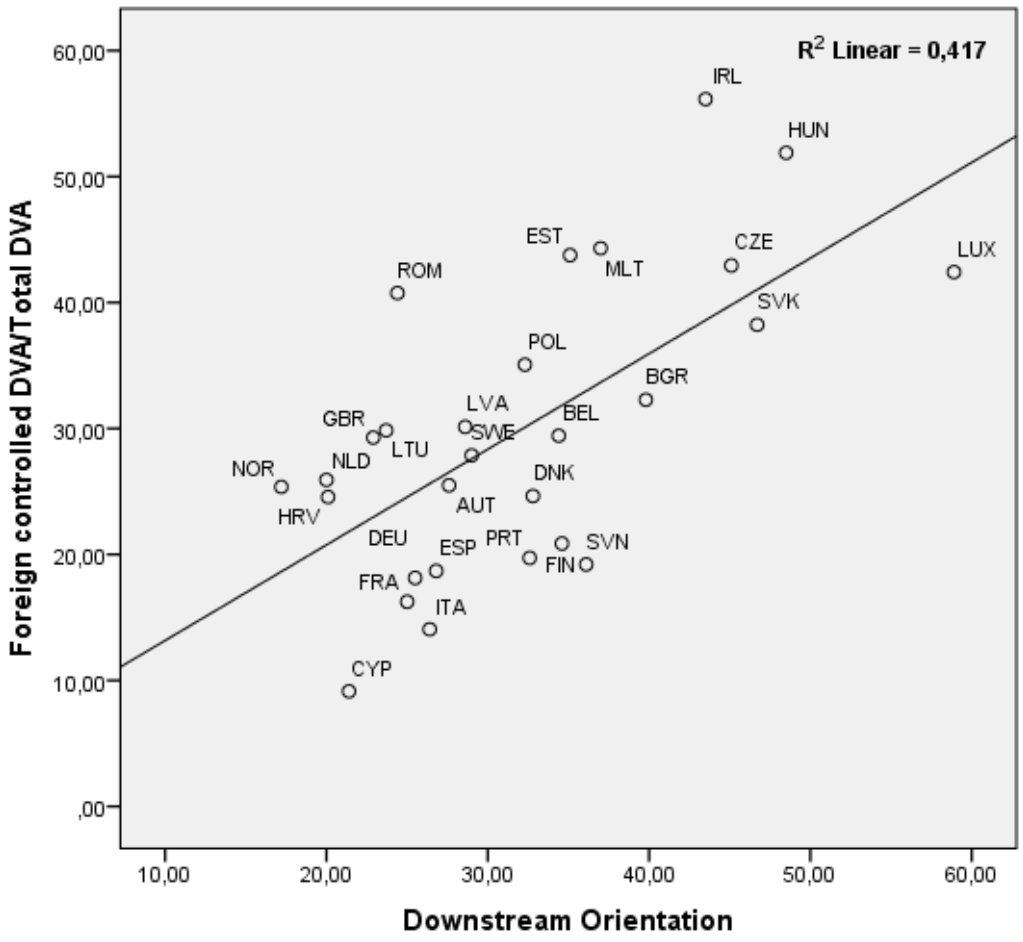
We can measure this by looking at the influence of Foreign Direct Investment. The downstream countries have influx of FDI, originating from asset seeking companies, either to benefit from lower wage costs in the case of the East and Central European countries, or the lower tax regimes, that have spurred investment in Luxembourg and Ireland. FDI is also high in the Netherlands, but not necessarily in the manufactory sector, since it seems that it targets investment in the service sector more. At the same time, there is also case to made for having large FDI influxes in the upstream economies, as we know that one of the motives for FDI is the exploitation of natural resources.

To test if there is a relationship between the downstream or the upstream orientation of countries, on the role that FDI plays in a country, I have run two models. The dependent variable is the Foreign controlled domestic value added, as a share of total value added. The foreign controlled share of domestic value added is taken from Eurostat, and was only available for European countries.

Coefficients[a]

Model		Unstandardized Coefficients		Sig.
		B	Std. Error	
1	(Constant)	5,586	5,882	,351
	Downstream Orientation	,759	,176	,000
1	(Constant)	43,104	9,176	,000
	Upstream Orientation	-,614	,414	,150

a. Dependent Variable: Foreign controlled DVA/Total DVA



There is a positive linear relationship between the downstream orientation of a country, and the share of a country's domestic value added, that is produced by foreign owned firms. There is no significant relationship between the upstream orientation, and the foreign controlled share of domestic production.

So, when it comes to which position is preferable, this still not clear, although there is evidence that for the European situation, a more downstream position can lead to more foreign owned firms in the share of national production – whether this is beneficial or not.

3.3 Introduction of regression analysis

In chapter 2, I have discussed the limits of CGE and SG models in predicting dynamic changes in trade relationships, especially in the functioning of GVCs. In the previous subchapter (3.1), I have shown the remarkable position of the Dutch economy in the European

economy, and the similarities it shares with the US position. I have also given an explanation for this unique position of the Dutch firms in the GVCs (3.2). As shown in subchapter 3.3, little is known about the merits of the GVC position, or whether the position matters. In this chapter, I will run a multinomial linear regression model, to test whether the GVC position of firms is a determinant of trade flows in intermediate products.

The cases that I use are the manufactory sectors of the EU27. The reason I have picked manufactured sectors, is because they are already relatively more fragmentized than the agricultural and service sector, which could be seen in figure 5. This has also been researched by Lejour et al. (2012). Besides this, the data on NTMs has a higher variety on an aggregated level than those on agricultural and service sectors. The EU27 has been picked, since the outside NTM AVEs are well-researched for the European Union. Also, the integration of world production is not very globalized: As Johnson and Noguera (2012) argue, despite the name may lead to believe otherwise, Global Value Chains are highly regional, and I am interested in the effects of Trans-Atlantic integration on the Dutch position in European trade. The 28th European member state, Croatia, was not included, as the value added data on trade in intermediate products in the TIVA database was available latest at 2011, and Croatia only joined the EU two years later.

The traditional trade regression is used to predict trade flows in intermediate imports of US products in the European manufactory sectors. My predicting variables are distance from the United States, and the total GDP of the European country. While the size of the economy and distance are hypothetically very important, there are also such things as ‘second nature’ geographies (Baldwin and Evenett 2012). These can be proxies like being landlocked, be an island nation. Furthermore, research has shown that historical and cultural variables are significant as well (see for example, Kohl and Brouwer, 2014).

$$Ln\ Imports\ US'intermediate =$$

$$constant + LN\ GDP + \ LN\ Distance + GVC\ Position + \ Tariffs\ and\ NTMs + \ Landlocked$$
$$+ English\ Language + Received\ Marshall\ aid$$

I have picked four proxies. These proxies are geographical (island, landlocked), cultural (common language), and economic historical (Marshall Aid). I could not add them all in my regression, since the collinearity between islands and the English language was too high. (For a more detailed data report, see page #). There are four islands in my dataset, the United Kingdom, Ireland, Cyprus and Malta, which also include the only three countries that have English as an official language. I have excluded islands, since I think it makes less sense than language.

Also, I have not included the often-mentioned colonial relationships variables. In other articles these variables are added, as an indicator of a shared history which positively influences trade through possible institutional proximity, and beside this, established trade links. One of the reason for not including this historical links, is that for the Trans-Atlantic case, this is already explained by adding the English language as a proxy. Secondly, the UK, France, Spain, the Netherlands, Sweden and Denmark all, at one point, have had a colony that would later become part of US' territory. However, this American colonial relationship was more intertwined between the UK, than between the former colonizer of the US Virgin Islands, Denmark. Therefore, I think that including them in a simply binominal variable, is misleading. For historical economic ties, I preferred the proxy of whether a country received Marshall Aid.

The null hypothesis with these type of multinomial linear regression is: There is no linear relationship between the imports of US' intermediate products on the one hand, and distance, economy size, GVC position, or whether a country is landlocked, has English as an official language, or received Marshall aid, on the other hand

3.3.1 Regression results

I ran three models; The regression results were statistically significant in these models, so I can reject my null hypothesis that there is no linear relationship between the amount of imports of US intermediate products, and my independent variable(s).

Model Summary[d]

Model	R	R Square
1	,212[a]	,045
2	,253	,064
3	,712	,506

Regression results

Anova

Model		df	F	Sig.
1	Regression	1	20,173	,000[b]
2	Regression	2	14,711	,000[c]
3	Regression	7	62,297	,000[d]

In the first model, my research variable, a regional sectors GVC position is solely tested on the imports from the United States. There is a weak (21.2 percent of the variance explained), negative linear relationship, meaning that a more upstream position in the GVC negatively influences the imports of US intermediate manufactured products.

In the second model, I have looked at the influence of tariffs and non-tariff measures, which was significant as well, although the negative linear relationship was weak. In the last model, I have added the other control variables. The natural logarithm of distance variable was strongly significant, and has a negative effect on the dependent variable, as could be expected. The natural log of the GDP of European countries was significant as well, and has a positive relation in the model, which is also not very surprising. From the proxies, only the outcome if a country had received Marshall aid had a positive linear effect. Whether a nation is landlocked, or has English as an official language are not significant; Especially the latter may be surprising. It may be explained by the problematic justification of the common language variable, as some countries like the Scandinavian countries have a high proficiency in English, although not recognizing English as an official language. Also, the fact that a

small country like Malta does recognize English as an official language, may have influenced this result, although the model was fixed for a countries' GDP as well.

Coefficients[a]

Model		B	t	Sig	VIF
1	(Constant)	3,318	30,180	,000	
	GVC Position	-,417	-4,491	,000	1,000
2	(Constant)	3,774	20,094	,000	
	GVC Position	-,426	-4,628	,000	1,001
	Tariffs and NTM	-,036	-2,980	,003	1,001
3	(Constant)	25,088	3,026	,003	
	GVC Position	-,381	-5,201	,000	1,187
	Tariffs and NTM	-,035	-4,059	,000	1,001
	Ln distance	-4,140	-4,721	,000	1,786
	Ln GDP	,550	9,341	,000	1,324
	Received Marshall Aid	1,222	6,158	,000	1,557
	Landlocked	,109	,508	,612	1,092
	English as official language	,504	1,735	,083	1,319

a. Dependent Variable: LN Import of US' intermediates

The regression results of the control variables were not very surprising, but the fact that my research variable remained significant even with highly influential predictors such as GDP and distance, was. Also, of secondary interest was that the Tariffs and NTM remained significant, meaning that we can look at how more trans-Atlantic integration under TTIP could influence the increase of US intermediate manufactory exports to the European market.

As the GVC position is a ratio, the interpretation is a little abstract. The other transport equipment sector in the Netherlands, for example, has a value of 1, meaning that it is a relative upstream sector. Would, in a hypothetical situation, this value be decreased with 1, it would be a neutral positon, being neither upstream or downstream. This would, *ceteris*

paribus, have an expected increase of imports US intermediates with 38% in this sector. The most important interpretation, however, is that the variable is significant. The interpretation of tariffs and NTM, which we will use for the final effects chapter, is that when tariffs are increased by one unit (which is in percentage points, as it is an Ad Valorem Equivalent), trade will decrease by 3.5%.

4. Estimation of the effects

In the previous chapter, I have shown that the position of GVC is indeed an important predictor when importing intermediate products from the United States. In this final chapter, I will first illustrate what the effects of tariff removal will mean. After this, I will discuss how the GVC position of Dutch and US sectors may have various potential effects on the trade flows of intermediate products. Lastly, I will show the importance of intermediate trade per sector, and the European and US dependency of exporting Dutch manufactory sectors.

4.1 Increased US competition through tariff and NTM removal

Two scenarios are calculated. In both, tariffs will be removed in all sectors with 90 percent. The effects of lower tariffs and Non-Tariff Measures were expected to increase trade with 3.5% once a percentage point is decreased. In table 3, we see what this would mean given the information on tariffs and NTM in Europe, for the imports of US' manufactures.

I follow Rojas-Romagosa (2016), who estimates the lower bound of NTM removal is only 3 percent of total NTMs, and the upper bound is 14 percent. The results are comparable with other studies, as the highest gains are expected in the semi-manufactured, semi-agricultural sector of Food products, beverages and tobacco, which obviously imports a lot of agricultural inputs. When it comes to the exact percentages, my estimates are comparable with the more moderate findings of the Francois model, and are lower than the Rojas-Romagosa, Aichele, Felbermayr and Fontagné studies. This is also logical, since trade in intermediate

inputs is even more regional than trade in final products, and therefore less influenced by US trade. From this scenario, Dutch suppliers may see increased competition in the export of intermediates to the food and beverage sector, the textiles and automotive sector.

Sectors	Tariffs	NTM	Lower Bound	Upper Bound
Food products, beverages and tobacco	15,13	26,30	**50,4**	**60,5**
Textiles, textile products, leather and footwear	6,81	7,90	**22,3**	**25,3**
Wood and products of wood and cork	1,01	7,90	**4,0**	**7,1**
Pulp, paper, paper products, printing and publishing	0,00	7,90	**0,8**	**3,9**
Coke, refined petroleum products and nuclear fuel	1,79	0,00	**5,6**	**5,6**
Chemicals and chemical products	2,16	10,20	**7,9**	**11,8**
Rubber and plastics products	4,84	7,90	**16,1**	**19,1**
Other non-metallic mineral products	2,99	7,90	**10,2**	**13,3**
Basic metals	2,26	15,80	**8,8**	**14,9**
Fabricated metal products	2,92	15,80	**10,9**	**16,9**
Machinery and equipment, nec	1,57	0,00	**4,9**	**4,9**
Computer, Electronic and optical equipment	0,70	7,90	**3,0**	**6,1**
Electrical machinery and apparatus, nec	1,99	7,90	**7,1**	**10,1**
Motor vehicles, trailers and semi-trailers	7,76	14,00	**25,9**	**31,3**
Other transport equipment	1,11	7,90	**4,3**	**7,4**
Manufacturing nec; recycling	1,50	5,20	**5,3**	**7,3**

Table 3 Tariffs and NTM estimations (Based on Egger et al., 2015, WTO Tariff Database, and Ecorys, 2009)

The effects of lowering tariffs and NTMs may differ between firms. As Felbermayr and Larch (2013) suggest, smaller companies will likely benefit more from NTM removal, and larger companies will benefit more from tariff removal. For example, US regulations requires cans of processed food products to have a certain size. Therefore, a European company needs to invest in a new machine to produce this product. For a smaller company, this investment is relatively higher. For a company that already produces and sells large quantities of products, this weighs less, and economies of scale will lead to a faster minimalization of these sunk costs in the total product costs. However, the tariff percentage is relatively more important, since this is fixed. Therefore, the discussed percentage in table 3 are only illustrative.

4.2 Framework for upstream and downstream sectors

However, not every sector has the same status as a supplier or a buyer in the trans-Atlantic context. Figure 8 compares Dutch and American sectors, and shows the potential increase of inputs from the United States in Europe. The graph is divided in four corners. The top left, are sectors that have a downstream position in the United States, and an upstream position in the Netherlands. The top right are sectors that are both upstream in the US as in the Netherlands. This is the most frequent observation. In the bottom left corner, sectors that are downstream in both countries are shown. Finally, at the bottom right, sectors that are downstream for the Netherlands, but upstream for the US are given.

The framework in table 4 shows what I theorize as likely to happen. In the table, I distinguish between dynamic value chain effects, and static value chain effect. The former can be further distinguished in backward and forward effects. Static effects can be further distinguished in direct and indirect effects.

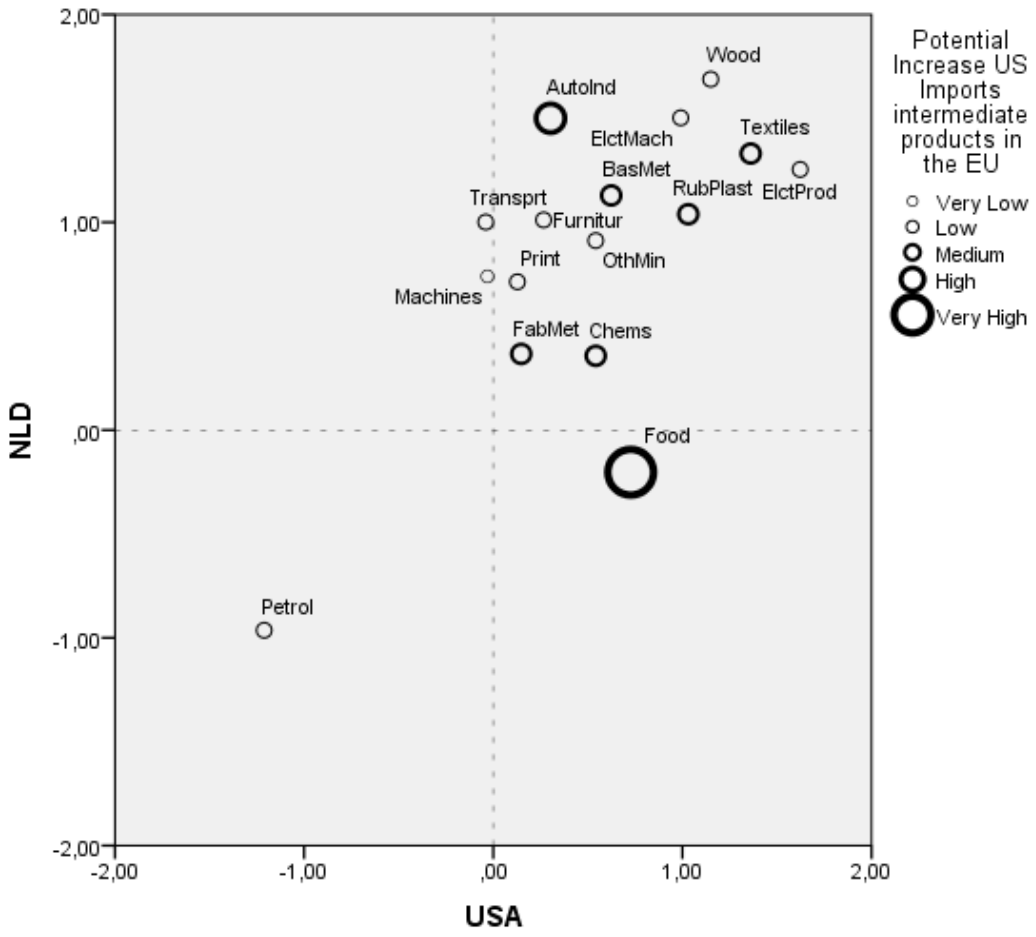


Figure 8 Dutch and American sectors GVC position. Own calculations, based on TIVA database

Dynamic effects are when the composition of value chain networks change. This may happen either through downstream companies which receive access to new, more competitive, inputs (forward effects) or when upstream companies can sell their intermediate products to downstream firms (backward effects). The static effects can be direct, when downstream companies can sell more products to a new market, or indirect, when an upstream company can sell more products, as there is an increase in final demand due to a larger market access.

The effects can be positive (+), negative (-), or mixed (+/-). When they are mixed, there is a situation when there is increased (or decreased) competition. The outcome for Dutch firms depend on the vis-à-vis competitiveness, which is influenced by innovation, business routines, economies of scale and so on.

Possible effects on Dutch firms' Value Chains		US Downstream	US Upstream
NL Upstream	More integration	A1) Dynamic backward effects + Indirect static effects +/-	B1) (Big) Dynamic backward effects +/- Indirect static effects +/-
	Less integration	A2) Dynamic backward effects - Indirect static effects: +/-	B2) Dynamic backward effects + Indirect static effects -
NL Downstream	More integration	C1) Dynamic forward effects - Direct static effects +/-	D1) Dynamic forward effects + Direct static effects +
	Less integration	C2) (Small) dynamic forward effects + Direct static effects: intra-Europe +, extra-Europe -	D2) Dynamic forward effects - Direct static effects -

Table 4

A1) There may be some positive dynamic backward effects expected, as Dutch upstream firms can supply downstream US firms. The indirect static effects depend on the competitiveness of downstream firms.

A2) The dynamic backward effects are negative, as Dutch firms can supply US firms less easy, and have to shift towards EU downstream markets. The indirect static effects may be beneficial for some firms, as downstream firms have less competition on the European market, and can take over some supply of US firms. However, they are negative as firms that depend on the US market, lose market share. Also, the decrease in competition will in the long term likely lower the market share in third countries. Then again, the long term effects

may be positive on extra-European trade, if it is a sector that has not fully grasp the scale building potential.

B1) The dynamic (backward) effects will be the highest in this group, as US and Dutch firms will compete with each other to supply downstream firms. Like the dynamic effects, the indirect static effects will depend on the competitiveness of firms further downstream.

B2) Dynamic backward effects in this group will tend to be positive, as Dutch firms will receive less competition from US firms to supply downstream European firms. The indirect static effects will be negative, as European firms will have lower market access due to disintegration. Furthermore, the decrease in competition may have negative long term indirect effects, as European firms may become less competitive.

C1) The dynamic forward effects may be negative, as downstream US firms demand for European inputs rises, which increases the price for downstream Dutch firms. As both sectors are downstream, the direct static effects will depend on firms' vis-à-vis competitiveness.

C2) Lower US demand for European inputs, may have some beneficial dynamic forward effects for downstream Dutch firms, as prices decreases. The direct static effects might be positive for Dutch firms participating in intra-European trade, as they will have less competition from US firms. Then again, they also have less market access to the United States. Furthermore, decreased competition will have negative long-term effects. (Both extra-European, but also intra-European when 2nd 3rd parties do become more competitive).

D1) There will be beneficial dynamic forward effects, as Dutch firms have access to more competitive US' inputs. At the same time, market access increases, and the increase of competitiveness due to cheaper inputs, have positive direct static effects.

D2) Dutch firms have less inputs from upstream US firms. Furthermore, firms may become less competitive, and have lower market access. Due to the lower competitiveness, export to 3rd countries may decrease as well.

As explained, the positive or negative influence depends on the downstream and upstream position of Dutch and US sectors. It is not simply the case that more integration will benefit all sectors, and less integration will always lead to losses. On the long term, reduced competitiveness, whether from a decrease in competitive inputs, or lower firm vis-à-vis competition, will likely lead to losses; especially when non-EU firms do have access to more competitive inputs and experience more competition. The exception is when the full scale potential has not been acquired yet; in this case, there may be positive effects from infant industries that can build up scale without having to compete to already scale exploiting 'winners' of the US market.

4.3 Importance of US and EU trade for Dutch sectors

Lastly, some sectors are more dependent on European trade than others. Table 4 gives an overview of this dependency. The exact effects on intra-European trade are estimated to have a decrease of 5% on a European level, but this is an effect on total trade, so it may and will differ between sectors. From the results of my regression, I show that the position in the GVC will influence this percentage, and will be higher where sectors are both upstream – which is the case for most US and EU sectors.

For every Dutch manufactory sector, intra-European exports of intermediate products accumulate to a share of at least 2/3. The only exception is Other Transport Equipment, which are for example the aviation and maritime industry. Obviously, TTIP also eases market access to the United States, so export increase is also expected. As we can see here, all sectors have less than 5% export orientation to the United States, except for the Petrol sector.

Destination of Dutch domestic value added in intermediate products Sectors	European Union in %	United States in %	DVA intermediate exports / total exports in %
Food products, beverages and tobacco	74,2	2,8	26,8
Textiles, textile products, leather and footwear	79,7	1,5	16,0
Wood and products of wood and cork	82,2	2,2	63,1
Pulp, paper, paper products, printing and publishing	76,6	1,6	60,6
Coke, refined petroleum products and nuclear fuel	79,5	6,5	39,0
Chemicals and chemical products	73,4	3,7	50,0
Rubber and plastics products	77,9	2,4	64,1
Other non-metallic mineral products	75,7	3,0	70,0
Basic metals	71,9	2,6	64,8
Fabricated metal products	70,2	3,2	59,4
Computer, Electronic and optical equipment	77,7	4,1	43,1
Electrical machinery and apparatus, nec	69,2	4,1	46,1
Motor vehicles, trailers and semi-trailers	69,8	2,4	31,5
Other transport equipment	35,0	4,7	34,7
Manufacturing nec; recycling	69,2	4,7	38,0

Table 5 Based on TIVA database

This high dependency on Europe as a market for intermediate products, means that even a small decrease in intra-European trade, can have big effects. Simple arithmetic shows that for example a decrease of Fontagné's 1.2% in intra-European trade in for example the Textile industry, would, *ceteris paribus*, have to lead to an increase of exports to the United States with 134% in order to break even.

At the same time, the importance of intermediate exports is not the same for each sector. Especially for the textile and processed food sector, the shares are relatively low. For other sectors, they contribute up to 50% or even as high as 70%. As these sectors rely more on

intermediate exports, dynamic GVC changes is expected to have a larger effect on exporting sectors.

4.4 Should TTIP not be signed?

As can be seen, tariffs, NTMs, GVC position, the share of intermediate products as a part of total trade, and the backward EU and US dependency, differs greatly between sectors. Dutch firms that provide intermediate inputs to other firms may see increased competition, especially when supplying to the processed food, automotive, and textile sector. However, some firms may profit from more competitive American inputs as well, or supply to American sectors. Lastly, for most sectors, the US is not that important as an export destination, but Europe is. Even a small amount of decrease in intra-EU trade, may be a big shock in some sectors.

Dutch firms participating in GVC are likely to profit relatively less (on average), than sectors in other EU member states who are positioned more downstream. Furthermore, they are generally, as upstream firms, more dependent on forward European linkages, than US linkages. However, this does not mean that TTIP is per definition bad for Dutch manufacturers. The position in the GVC is not fixed: In the long term, Dutch firms may adjust to this process, and capital and labor may move to more competitive sectors. Also, my thesis only discusses the effects on a limited amount of manufacturing companies: not all companies export, and even less participate in GVCs.

Also, on a societal level, my thesis does not discuss the positive effects on welfare gains, i.e. consumption. Secondly, I do not speculate on spillover effects. This does not mean that TTIP will not realize spillover effects. Perhaps the most important *chapeau* of TTIP, is to reach a “golden standard of trade” (US Chamber of Commerce, 2014. If this is achieved, there are big advantages for European firms and consumers to be, to borrow the analogy of Hamilton and Pelkmans (2015) a rule maker, instead of a rule taker.

Lastly, trade agreements are also motivated by geo-strategical advantages (Hamilton and Blockmans, 2015). Even when economists argued that the internally liberalizing of the European economy wouldn't lead to the most efficient distribution of production factors, nor be in the best direct interest of non-European firms, the stabilizing effects, and prevention of war, were seen as more important by policy makers in Europe and the United States alike. More Trans-Atlantic agreement can also release the unease dependency from some European countries on imports from countries which regimes don't have high democratic standards.

Conclusion and discussion of results

In my first chapter, I have given an overview of the development of international trade theory. Neoclassical perfect competition based on Ricardian factor endowments has been criticized empirically and theoretically, which influenced the models that make ex-ante predictions on trade. However, indexes based on Ricardian comparative advantage, are still the most important predictor to determine which sector in which country will expand or decrease when engaging in a trade agreement.

There has been a lot of critique on these measurements. In the literature, mathematical problems have been discussed. An alternative way of calculating revealed comparative advantage improved estimation of trade flows.

I have shown that the data and type of revealed measurements influences the outcome of which Dutch sectors have a comparative advantage or disadvantage. Also, in a period roughly half of the long-term effects that are measured in these trade models, the status of comparative advantage often changes. I therefore join the call for a need of a better predictor of competitiveness.

Predicting trade flows is an incredibly complex process, and very dependent on certain assumptions. Obviously, abstractions have to be made. Therefore, in the most important dataset (GTAP), there is no distinction between gross trade flows and intermediate trade flows. In chapter 1, I have discussed how certain theoretical abstractions don't always fit the empirical geographic flows. I argue, that the GVC position of countries, is, like international trade, also an economic geographical phenomenon, that can influence the outcome of trade.

The study of what determines a countries position in the GVC, and what the merits or demerits of this position is still relatively new. I have theorized that the Dutch geographical position as a port nation in the core of Europe, close to production centers in Germany, has

enabled a Weberian optimum location for many Dutch firms in the upstream position of GVCs, although this is not the case for the Belgium case. It would be interesting to see why the Netherlands has an upstream position, and Belgium has not. When it comes to what is preferable, there is no relationship with GDP, but there seems to be a positive relationship with the number of foreign firms that control production in more downstream economies, whether this is advantageous or not.

In my 3rd chapter, I have provided empirical evidence for the claim that the GVC position matters when attracting US imports. Due to both practical (data constraints) as analytical (higher fragmentation) motives, the imports from US intermediates by European manufactory sectors were picked. Based on a multivariate regression, it shows that even with strong predicting variables such as the size of an economy and the distance from the United States, a more downstream GVC position still has a significant positive influence.

As the Netherlands has a relatively similar position in GVCs as the United States, Dutch firms participating in GVCs may profit less than sectors in European countries that are more downstream. The impact will be mixed, since there are differences on the current level of protectionism in the sense of tariffs and NTMs, the position of GVC on its own and compared to the US, the size of intermediate exports as a share of total exports, and the dependency on European and US trade.

I have shown that the GVC position of countries matter when importing intermediates from the United States. This does not mean, that it will automatically always matter in every bilateral trade relationship. For a mixed economy, these effects will probably not be witnessed. It would be interesting to see if the GVC position will also influence imports from other upstream countries, or exports to downstream countries.

I have argued that the upstream position of the Dutch economy is a result of an evolutionary Weberian process, and criticized the static relationship of input and output

linkages. However, when the Trans-Atlantic economy becomes more integrated, it is not unlikely that the GVC position of countries and sectors will change accordingly. For example, since there will be a new market to the west, downstream countries and sectors on the Eastern peripheries of the European market, may move more upstream, providing inputs for Western-European economies, like the Netherlands. Therefore, the dynamic effects may just be short term, and a new equilibrium may have different effects.

My thesis discussed the possible impact of TTIP, so obviously, an ex-post examination regarding Dutch firms participating in GVCs will be very interesting to see. However, the current political climate does not look favorable for TTIP. A more concrete case study would be the Brexit, although the UK does not have a comparable GVC position as the US. Furthermore, as mentioned, more research by economic geographers in looking at the GVC position of sectors and countries is encouraged, as well as research on the impacts of these positions on economic performance.

Lastly, globalization and trade liberalization is not only a story between nations, but within nations as well, as has become increasingly clear in recent elections and referendums in Europe the United States. Current research has not examined the effects of TTIP on intra-national divergence of income and employment. This also because of practical reasons, as data is primarily available on national levels. However, a forthcoming update of the WIOD will have more regional detail as well, so in the short future, research can also better look at regional differences.

Data report

There are 27 countries, and 16 manufactured sectors, totaling for 432 cases.
The 27 countries correspond with the countries that were in the European Union in 2011, the year of the most recent data for the backward and forward position of industries, which is needed for the determination of the GVC position. Compared to the EU28 (begin 2017), that excludes Croatia.
The 16 manufactured sectors are based on the aggregation of manufactured sectors by the OECD.

The normality of the dependent variable is tested by the Shapiro-Wilk test. Where,

H_0 = The distribution of the variable is normally distributed

The *p* value is not significant, meaning that we accept the null hypothesis.

Tests of Normality

	Shapiro-Wilk		
	Statistic	df	Sig.
LN imported prod	,994	432	,075

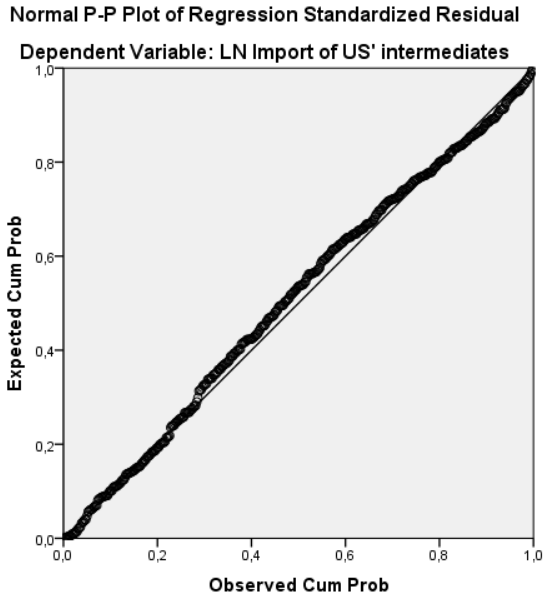
As customary in trade regressions, the natural logs have been taken for the dependent variable, and the GDP and distance variable.
There is no multicollinearity, as the VIF value does not exceeds 10 (see page), nor does any of the independent variables correlate with an effect that exceeds 0,5.

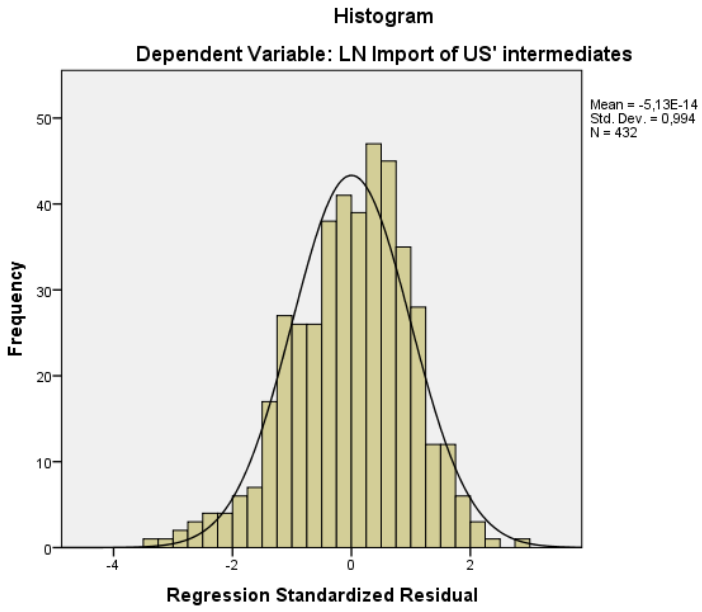
Coefficient Correlations[a]

Model		GVC Position	Tarrifs and NTM	Received Marshall Aid	Landlocked	English as official language	LN GDP
	Tarrifs and NTM	,036					
	Received Marshall Aid	-,172	-,006				
	Landlocked	,145	,005	-,005			
	English as official language	-,282	-,010	,029	,153		
	LN GDP	,010	,000	-,199	,184	,271	
	Ln distance	-,264	-,009	,482	,029	,360	,256

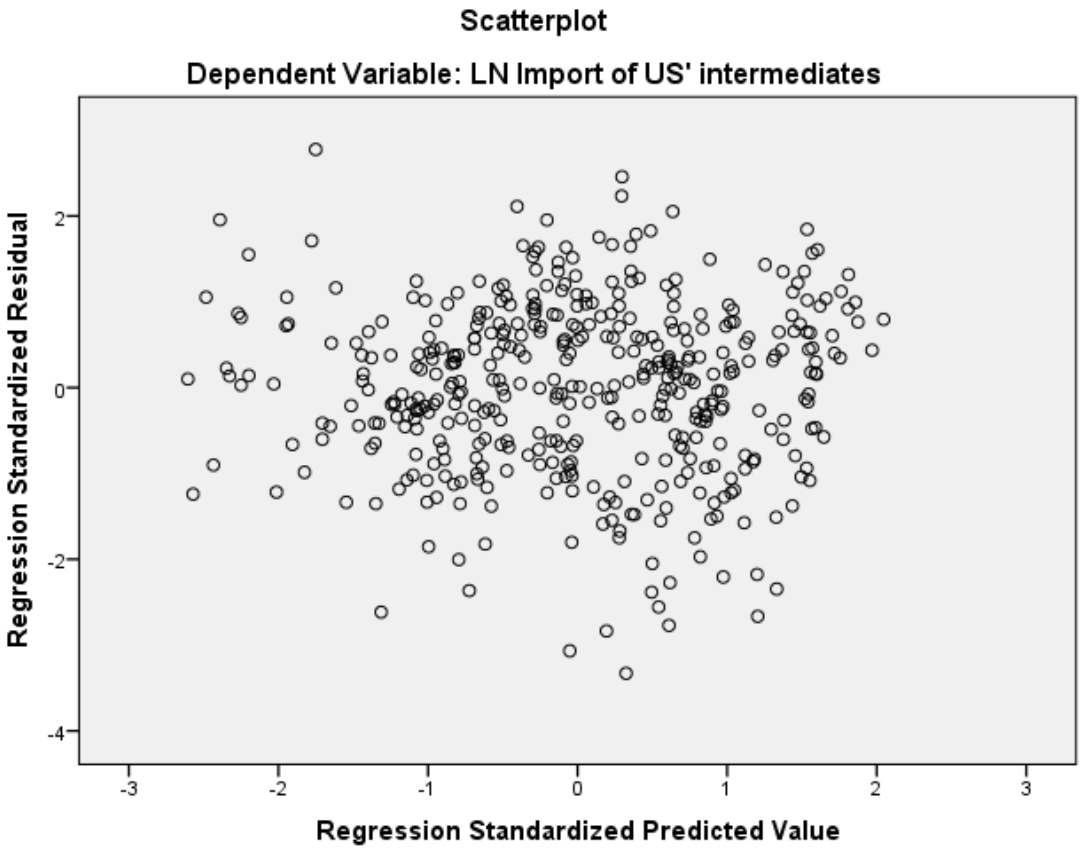
a. Dependent Variable: LN Import of US' intermediates

The residuals of the dependent variable are normally distributed, as can be seen from the normal pp plot and the histogram.





Also, the scatterplot of the standardized predicted value of the dependent variable on the x axis, and the standardized residuals on the y axis, do not show a strong heteroscedastic distribution.



Bibliography

Aichele, R., Felbermayr, G. & Heiland, I. (2014) Going deep: The trade and welfare effects of TTIP. *Cesifo Working Paper no 5150: Category 8: Trade policy.*

Aichele, R., Felbermayr, G. & Heiland, I. (2016) Going deep: The trade and welfare effects of TTIP revised. *Ifo Working Paper no. 219:* Ifo institute, University of Munich

Anderson, J. & Van Wincoop, E. (2003). Gravity with gravitas: A solution to the border puzzle. *American Economic Review,* 93(1):170-192.

Balassa, B. (1965). Trade liberalisation and "revealed" comparative advantage. *The Manchester School,* 33(2): 99-123.

Baldwin, R. & Evenett, S. (2012). Value creation and trade in 21st century manufacturing: What policies for UK manufacturing. In: D. Greenaway, ed., *The UK in a Global World.* London: CEPR, 71-128.

Baldwin, R. & Lopez-Gonzalez, J. (2015). Supply-chain Trade: A portrait of global patterns and several testable hypotheses. *The World Economy,* 38(11): 1682-1721.

Baldwin, R. & Venables, A. (2010). Relocating the Value Chain: Offshoring and Agglomeration in the Global Economy. NBER Working Papers 16611.

Berden, K., Francois, J., Thelle, M., Wymenga, P. & Tamminen, S. (2009). *Non-Tariff Measures in EU-US trade and investment: An economic analysis.* Rotterdam: Ecorys.

Bekkers, E. & Rojas-Romagosa, H. (2016). Literature survey on the economic impact of TTIP. Den Haag: CPB.

Brakman, S. & Heijdra, B. (2001). *The Monopolistic competition revolution in retrospect.* Cambridge: Cambridge UP.

Brakman, S. & Marrewijk, C. van (2015). A closer look at revealed comparative advantage: Gross-versus value added trade flows. Available at: http://www.cesifo-group.de/portal/page/portal/DocBase_Content/WP/WP-CESifo_Working_Papers/wp-cesifo-2015/wp-cesifo-2015-04/cesifo1_wp5321.pdf Accessed 09-09-16.

Capaldo, J. (2014) *The trans-Atlantic trade and investment partnership: European disintegration, unemployment and instability.* Working paper no. 14-03. Medford: Global development and environment institute.

Carrère, C., Grujovic, A. & Robert-Nicoud, F. (2014). *Trade and frictional unemployment in the global economy*. International trade and regional economics and labour economics no. 10692. London: Centre for Economic Policy Research (CEPR).

Cipollina, M. and Salvatici, L. (2010), Reciprocal Trade Agreements in Gravity Models: A Meta-Analysis. Review of International Economics, 18: 63–80. doi:10.1111/j.1467-9396.2009.00877.x

Costinot, A. and Rodríguez-Clare, A. (2013). Trade theory with numbers: Quantifying the consequences of globalization. NBER Working Paper No. 18896

Deb and Hauk (2015) RCA indices, multinational production and the Ricardian trade model *International Economics and Economic Policy* 1-25

Duprez, C. and Dresse, L. (2013). The Belgian economy in global value chains. An exploratory analysis. *National Bank of Belgium Economic Review* (2), 7–21.

Erixon, F. and Bauer, M. *(*2015). *Capaldo fails to convince*. ECIPE Blog. Available at: http://ecipe.org/blog/capaldo-fails-to-convince/ Accessed 20-11-2016.

Escaith, H. & Gaudi, H. (2014). Clustering value-added trade: Structural and policy dimensions. Lausanne: WTO Economic Research and Statistics Division.

Fally, T. (2011). On the Fragmentation of Production in the US. Boulder: University of Colorado-Boulder.

Felbermayr, G., Heid, B., Larch, M. & Yalcin, E. (2014). *Macroeconomic potentials of transatlantic free trade: A high resolution perspective for Europe and the world Economic Policy*. 60th Panel Meeting. Rome: Einaudi Institute for Economics and Finance (EIEF).

Felbermayr, G. & Larch, M. (2013). T*he Transatlantic Trade and Investment Partnership (TTIP): Potentials, problems and perspectives*. Forum 2. Munich: CESifo.

Ferrarini, B. & Hummels, D. (2014). Asian and global production networks: Implications for trade, incomes and economic vulnerability. Mandaluyong: Asian Development Bank.

Francois, J., Manchin, M., Norberg, H., Pindyuk, O., and Tomberger, P. (2013). *Reducing Trans-Atlantic Barriers to Trade and Investment*. London: Centre for Economic Policy Research (CEPR).

Fujita, M., Krugman, P., & Venables, A. (1999). The spatial economy: Cities, regions and international trade. Cambridge: MIT Press.

Grubel, G. & Lloyd, P. (1975). Intra-industry trade: The theory and measurement of international trade in differentiated products. New York: Wiley.

Hamilton , D. & Blokmans, S. *The geostrategic implications of TTIP.* Brussels: CEPS report no. 105.

Hamilton, D. & Pelkmans, J. 2015. *Rule-makers or rule-takers: Expolring the Transatliatnic Trade and Ivnsetment Parthernship.* London: Rowman & Littlefield.

Helpman, E. & Krugman, P. (1985). Market Structure and International Trade. Cambridge: MIT Press.

Hoen, A. & Oosterhaven, J. (2001). On the measurement of comparative advantage. Groningen: s.n.

Hufbauer, G. 1965. *Synthetic materials and the theory of international trade* . London: Gerald Duckworth.

Johnson, R. & Noguera, G. (2012).Fragmentation and trade in value added over four decades. Cambridge: NBER Working paper series.

Kohl, T, & Brouwer, A. (2014). The development of trade blocs in an era of globalization. *Environment and planning A*, 46(7): 1535-1553.

Koopman, R., W. Powers, Z. Wang & Wei, S. (2012). Give Credit Where Credit is Due: Tracing Value Added in Global Production Chains. Research Working Paper 16426. Cambridge: Cambridge UP.

Krugman, P. (1996). Ricardo's Difficult Idea. Available: http://web.mit.edu/krugman/www/ricardo.htm. Retrieved 11-11-2016.

Krugman, P. & Venables, A. (1990). Integration and the competitiveness of peripheral industry. In: Bliss C. and Braga De Macedo J. (eds), Unity with diversity in the European economy: The Community's Southern frontier. Cambridge University Press.

Lee, J. (2011). Export specialization and economic growth around the world. *Economic Systems* 35(1), 45-63.

Leontief, W. 1954. Domestic production and foreign trade: The American capital position re-examined. *Econ. internazionale* (7):3-32.

Lejour, A., Veenendaal, P., & Rojas-Romagosa, H. (2012). *Identifying hubs and spokes in global supply chains using redirected trade in value added.* Den Haag: CPB.

Maneschi, A. (1998.) Comparative Advantage in International Trade: A historical perspective. Cheltenham: Edward Elgar.

Matsushita, M. (2014). A View on Future Roles of The WTO: Should There be More Soft Law in The WTO. *Journal International Economic Law*, 17 (3): 701-715.

McCann, P. (2013) *Modern urban and regional economics* Oxford: Oxford UP.

McCann P. & Acs Z. (2011). Globalization: Countries, cities and multinationals. *Regional Studies*, 45: 17-32.

Melitz, M. (2003). The Impact of Trade on Intra-Industry Reallocations and Aggregate Industry Productivity. *Econometrica*, 71(6): 1695-725.

North, D. (1990). Institutions, institutional change and economic performance. Cambridge: Cambridge UP.

OECD. (2013). Interconnected economies: Benefiting from Global Value Chains. OECD Publishing. Available at: https://www.oecd.org/sti/ind/interconnected-economies-GVCs-synthesis.pdf Acesses 10-10-2016.

Porter, M. (1986). Competition in global industries: A conceptual framework. In M.E. Porter (Ed.), Competition in global industries. Boston, MA: Harvard Business School Press. (1986)

Ricardo, D. (2001 [1817]). *On the principles of political economy and taxation.* Kitchener: Batoche Books.

Rodrik, D. (2015). *The War of Trade Models.* Dani Rodrik's weblog. Avaialbale at: http://rodrik.typepad.com/dani_rodriks_weblog/2015/05/the-war-of-trade-models.html Accessed 09-09-16.

Sanidas, E. & Shin, Y. (2011). Convergence towards the revealed comparative advantage neutral point for East Asia: Similarities and differences between the three countries. *Seoul Journal of Economics,* 24(11): 21-50.

Smith, A. (2005 [1776]). *An inquiry in the nature and causes of the wealth of nations.* Old Main: Pennsylvania UP.

Timmer, M., Los, B., Stehrer, R., and Vries, G. de. (2013). Fragmentation, incomes and jobs: An analysis of European competitiveness. Frankfurt: European Central Bank.

US Chamber of Commerce (2014). TTIP: A Transatlantic business imperative. Accessed on 21-2-2016 via https://www.uschamber.com/speech/ttip-transatlantic-business-imperative.

Vernon, R. (1966) International investment and international trade in the product cycle. *The quarterly journal of economics*, 80(2): 190-207.

WTO (2016) All European Union, Source: Dtat on MFN Applied Tariff, European Union, WTO, 2016)

Yu, R., Cai, J., & Leung, P. (2009). The Normalized Revealed Comparative Advantage Index. *Annals of Regional Science,* 43 (1): 267-82.