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# The effects of TTIP – An Analysis of the German Automotive Industry

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Alexander Schimpke (s1191004)

1st Supervisor Prof. Dr. Groenendijk  
2nd Supervisor Prof. Dr. G. J. Hospers

## Summary

Trade agreements have been a major contributor of economic development and a reason for wealth and prosperity of nations. The unique project of the European Union stands as an example of international economic cooperation par excellence. However, economic integration does not only generate positive outcomes. As the domestic market expands competition increases as well. Economic integration in the form of trade agreements have flourished over the last decades, which lead to an extensive analysis of trade agreements and a positive perception in general.

Therefore I want to take a look at the effect of the EU-US trade agreement, which is currently under negotiation. I will specifically focus on the automotive sector as one of the biggest sectors in the EU and Germany respectively. For my study I based my research on a literature review as well as an analysis of policy documents. I made use of a lot of secondary data to back up my theories and findings. As I want to predict outcomes in the future I take a look back and compare the TTIP agreement to a more recent enlargement namely the Eastern Enlargement of the European Union.

I found that the Eastern Enlargement serves as a good example for comparison, because even though the countries do differ, in general, the EU will face similar challenges, when it comes to competitive pressures. As a result it is shown that the eastern enlargement lead to a decrease the employment of low- and medium-skilled workers, as well as to a fall of relative wages paid to them. I used an extensive scenario of the TTIP enlargement and found that the German automotive industry will respond with increased vertical specialization, which would in turn lead to a higher comparative advantage.

My analysis serves as a building block for further investigation and research. The concept of competitiveness is very broad and the automotive sector is one of the most complex sectors in Europe. Therefore more data has to be collected and more research has to be done to reach a more extensive conclusion. This does especially count for the data on competitiveness and the concept of the Global Value Chain, which I used in my analysis.

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# I. Introduction

## 1.1 Background

This thesis is about the Transatlantic Trade and Investment Partnership, which is currently under negotiation between the EU and the US has been a huge source of discussion around scholars and the media. Essentially the agreement is a follow-up from earlier proposals, all directed towards the goal of managing trade across the Atlantic. The TTIP agreement is supposed to open up both markets to facilitate and foster trade. Even though tariffs are already low on average (between 2-3% on average), some products are still subject to considerable taxes, like the 10% import-tax on light trucks in the US. The main concern are however Non-Tariff Barriers. Those costs are created indirectly through differing requirements and standards. One example might be the existence of different security standards in both countries, meaning that companies have to construct essentially similar products differently, to cope with the differing national legislation (Franscois, 2013). The effects of trade liberalization are well studied. An abolishment of those barriers would lead to an increase in trade and more product variety in both countries (f. ex. Akthar, 2014). Especially for the EU, trade liberalization is one of its top priorities and essentially its purpose. Back in the 1950's, when the European Coal and Steel Community was founded, the idea was to liberalize trade among the participants. After that countless agreements have been signed to follow that specific goal. Every enlargement, increased the size of the market leading to a facilitation of trade on the one side and to an increased competition on the other side.

Germany, being one of the founding nations of the EU has been subject of constant change. Today, the automotive industry is the most important manufacturing sector in Germany. After the industry struggled mightily in the early '90s, especially the eastern enlargement and profound restructuring of the sector made it one of the most competitive industries in Germany. The automotive sector constitutes roughly 20% of the total German industry revenue and has a worldwide reputation as the most innovative production location (GTAI, 2014). Every enlargement of the European Union means new opportunities and challenges for the sector. The new TTIP agreement has in

that sense been the content of much discussion over the last years. The different scenarios that have been projected are all highly based on assumptions. In general an enlargement is simply a way of increasing a nation's domestic market, an incorporation of another domestic market, and as such they are similar. Therefore I will take a look into the past to make a prediction for the future. As an example I will use the eastern enlargement of the European Union, which had due to its labor cost differences and location advantage a huge influence on the German automotive sector.

The integration of two markets is economically achieved by lowering or abolishing the barriers between them. In the context of TTIP tariffs and non-tariff barriers are under scrutiny. Especially the latter seems to bare huge potentials. As mentioned above, the tariffs are rather low among the two countries, but if one looks into the details, some vehicles are subject to tariffs of up to 15%. Regardless of the outcome of the negotiations an increase in production is expected and scholars are only undecided on the amount, which will remain to be seen until the very end. The opening up of the market will lead to more competition, which can be as risky as beneficial. Again the look into the past will reveal, how German businesses reacted when they were challenged with similar threats during the eastern enlargement. Back then, expectations were a breakdown of the automotive sector due to the lower production costs of the eastern countries.

As the sector is already highly competitive as well as globally divided, competitiveness seems to be the key to survival in the long run. As Bernaciak (2010) stresses, the eastern countries (and Poland in specific) became very integrated after the enlargement. She also stresses the change of the industries. The expected shift of the labor-intensive components of the car manufacturing did occur, but the German automotive industry in turn reacted by focusing on high-quality production. So while at first glance, TTIP seems to be beneficial when it comes to increased output or production. A look into the past indicates that past expansions lead to restructuring within the industry, which kept it competitive. To say that this will play out as beneficial as it was the last time is far from definite.

After a long and painful transition of the sector, the new expansion of the market will create new opportunities as well as threats to the industry. Having

outlined the context of the expansion for the industry, this study is supposed to find out how the market expansion is going to effect the sectors competitiveness.

## 1.2 Research Methodology

This section is meant to describe the structure of my analysis, to make clear how I will go about my research.

My thesis includes three research questions, each of which will help me to answer the main research question:

*“To what extent is the likely conclusion of the Transatlantic Trade and Investment Agreement (TTIP) going to effect the competitiveness of the German automotive industry?”*

Thusly the main part of my thesis is further divided into three sub-questions. During my research I will use a literature review with a special focus on policy documents. I will back up my findings primarily with secondary data.

The first question is about the relation between the main concept of competitiveness and its relation to the German automotive market. This is done by further dividing it into three parts. First of all the general concept of competitiveness, where I will introduce what this concept is about and what research has been done already. Also I see this part as especially important due to the lack of a clear definition of competitiveness. After that in the second part I want to introduce the concept of the Global Value Chain as a way of approaching competitiveness. Here I want to refer to the work of scholars like Timmer (2013) who use a new model based on the Global Value Chain approach to evaluate the competitiveness of European Countries. In this section I also want to separate the approach from other possible approaches, like an evaluation based on gross export volumes. The third part will focus on the connection between the Global Value Chain approach and the German automotive industry. The second sub-question ‘How did eastern enlargement effect the competitiveness of the German automotive industry?’ is specifically focusing on the effect of the Eastern Enlargement on the German automotive industry, this section is providing a more general outlook on how the automotive industry has changed to the establishment of Global Value Chains. As mentioned before, the second part of my research will focus

on a specific example, being the Eastern Enlargement. As the TTIP agreement has not been concluded yet and due to more pressing political issues at the moment, it seems as if it will take even more time. Therefore my look into the past will help me to make a prediction of the future. This section is divided into two parts. In the first part I want to introduce the Eastern Enlargement itself. Here it is important to further deepen the understanding of the relationship between the concept of the Global Value Chain and the German automotive industry. The second part of this sub question will introduce the model Global Value Chain – Income put forward by Timmer (2013). I will also make a clear distinction on why I want to use this variable. Also I want to further elaborate on why I choose for certain intermediate goods rather than on others or only on final goods all together.

The third part of my analysis is comprised of three questions. In the first section I want to give a short introduction on the TTIP agreement. As I already introduced the agreement in its entirety I now want to focus on its economic dimension. The second section is going to be on the comparison between the Eastern Enlargement and the TTIP agreement. This section will draw upon the findings of the second sub-question and elaborate to what extent one can compare this agreement to the TTIP agreement, as there are some obvious differences. First of all the markets are very different, as the US and the EU are both developed countries with strong market economies, which was not the case when the Eastern Countries were introduced into the EU. Second of all the compared to Germany the two economics have different advantages and disadvantages, when comes to international trade. For one the Eastern Countries have a location advantage. The third section will focus on the eventual outlook. This last section is especially important as there are different outcomes of the negotiations. These are often described as scenarios. The Eastern Countries were introduced into the European Union, which meant an extensive harmonization of rules and tariffs. The TTIP agreement has not been concluded yet, as I mentioned before. Therefore I have to compare the different harmonization scenarios. As for the sake of this analysis I will assume a rather high level of harmonization of rules and an extensive reduction of tariffs.

## II. How can we define and measure competitiveness of the German automotive industry?

### 2.1 Competitiveness: An Introduction

This section is supposed to give an introduction to the concept in use and the way I want to use it. Competitiveness itself is a very broad, complicated and highly complex concept, which therefore needs a lot of defining and narrowing down in order to make it applicable. The concept has always been of great importance and has therefore attracted a lot of attention. Especially in the wake of the much cited phenomenon of Globalization. When the local became exposed to the global, threatened by more and more competition, the competitiveness of industries and countries was studied and evaluated to predict and eliminate weaknesses and assure survival in the market place. In example was the competitiveness campaign of the United States in the late 1980's. Democrats as well as Republicans agreed that competitiveness was directly related to job security, standards of living expectations for future conditions of living. It was also believed to be positively related to trade as higher exports would lead to a trade surplus, which in turn would create jobs and wealth. Whether or not this overemphasis was necessary has not been proven, yet, even though several studies had been conducted (on trade deficit: Lenz (1991) or Parry (1994)). Nevertheless this indicates how contested the concept still is, leading Krugman (1996) to emphasize that the word "competitiveness cannot be found in any international economics textbook as well as a comparison of the growth rate or the level of technological development (Irawan, 2013).

Competition can also be conceptualized by focusing on different aspects like low-production costs or exchange rate level within a country, as well as on the level of technological development or exchange rate fluctuations. The OECD, as yet another example, defines competitiveness (in international trade) as "a measure of country's advantage disadvantage in selling its products in international markets". The focus here lies on the more competitive nature of a product under



steady pressure of the markets. All these measures have been applied over the last decades have been applied to certain success.

Globalization, however, has changed the way we have to look at trade in today's economies. First of all international transportation costs saw a downfall over the last two decades, reducing trade costs and making it cheaper to trade with suppliers in greater distance. Complimentary several trade agreements were introduced (first and foremost the establishment of the European Union), which brought down tariffs and quotas. Those enlargements often lead to a reduction in administrative costs and a harmonization of rules. All these developments and I am just naming a few developments, made it easier for companies to expand their markets. Daudin states that the expansion in international trade has been aggrandized by a new scheme based on cross-border production, where "different stages of production are spread across a range of sites in multiple countries" (Daudin, 2011, p.1404). As Feenstra (1998) reminds us, this process has been referred to under a different alias including delocalization, disintegration of production, fragmentation, global production sharing, international outsourcing, slicing up the value chain, processing trade, and so on and so forth. When the "competitiveness of countries was measured by domestic clusters of firms mainly competing sector by sector (...) in this new phase international competition plays itself at the level of tasks within firms, rather than at the level of products. So instead of looking at total trade flows between countries, Timmer (2013) suggests to look at the different stages of the production process to pinpoint who is adding the value when.

In the following section I want to take a closer look into the Global Value Chain perspective (hereafter GVC), proposed by Timmer (2013).

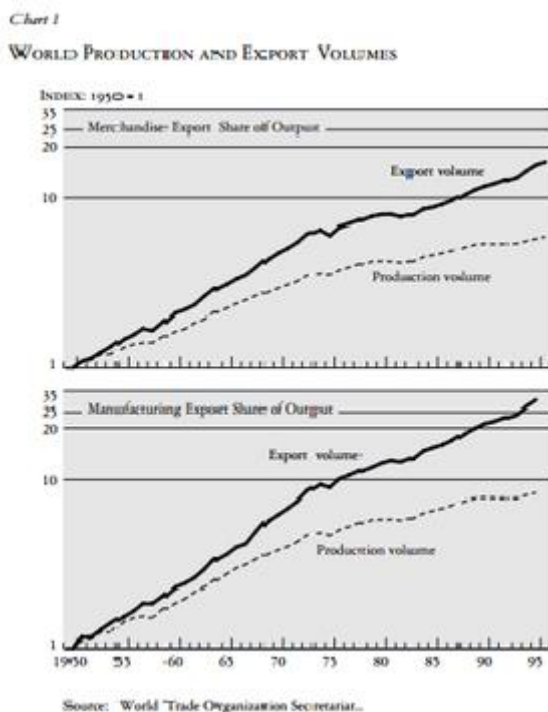
## 2.2 The GVC model as a measure of Competitiveness

Competitiveness as mentioned above has been lacking a clear-cut definition for the last decades. Indicators that have been used so far focus on gross exports, share in world exports or production volume. In general one can describe these factors as a sector by sector analysis. As has been put forward by Timmer (2013) these findings are inaccurate. Over the last decade falling transport and tariff costs as well as an improved legal framework between countries (with a special focus on EU countries) and advancements in the communication technology changed the picture of world trade relationships. A trade between sectors changed into a trade of task, the development of the Global Value Chain (hereafter GVC). Timmer (2014) defines the GVC of “a final product as the value added of all activities that are directly and indirectly needed to produce it” (Timmer, 2013, p.100). Türkcan (2011) points in a similar direction as he states that “a distinguishing feature of the present economic globalization is fragmentation of production” (Türkcan, 2011, p.150).

As a practical example it is often referred to the work of Dedrick (2011). In his case study a specific focus is laid on a product (being the iPad and the iPhone) and its composition in the Global Value Chain. The goal was to determine, which country ultimately produces the most value incorporated into the final product. Timmer (2013) states that the starting point for this study was the fact that traditional measures of competitiveness indicated that countries like China and India (as an example) have improved their respective competitiveness over the last decade, posting booming export numbers of sophisticated products. Combined with studies on declining manufacturing numbers in developed countries like Japan, European Countries or the US a competitive threat was created. Product studies however indicated that the aforementioned countries were still capturing a majority of the actual value chain, hence the value created in the final product. This becomes evident as we go back to our iPhone/iPad case study. The study revealed that China keeps less than 4 per cent of a product's

export value for its labor and capital employed (Timmer, 2013). First of all this study proves not only the validity of the Global Value Chain, but also the necessity of further research in that area.

As has been noted above, the GVC is accompanied by an ever extending fragmentation of production, which in turn leads to more trade. This fragmentation is caused by cost advantages and factor endowments in the respective countries, which is also referred to as vertical specialization. Hence if a country imports a good, which in this case could be labeled an intermediate good, as an input to produce its own good, one would be talking about the vertical specialization (Hummels, 1998). This phenomenon is opposed to a situation in which a country would choose to, instead of exporting the produced good into the market, establish its own production facility in the market to serve local demand. Instead of increasing international trade, trade would decrease.



(Source: Hummels (1999) Vertical specialization and the changing nature of world trade, p.80)

The two graphs above underline the effect of the GVC on trade. According to the World Trade Organization (hereafter WTO) the export and the production volume of manufactured output have been departing since the 1950's. This trend is not only going on ever since then, but is also magnified, as can be seen by the increasing gap between the two lines. As for the reasons, I have already mentioned technological advancements, reduction in transportation costs, reduction of tariffs and especially the fall or harmonization of non-tariff barriers (for example through the accession into the EU).

As is argued by Timmer (2014), advanced countries tend to specialize in delivering capital and high-skilled labor, which is capturing most of the value of the product, whereas the low-skilled, labor intensive tasks are outsourced to less advanced countries. This section was meant to elaborate on the connection between my theoretical model, competitiveness, and its relation to the model of Global Value Chain. The following section is going to examine the relation between the Global Value Chain and its relation to the automotive sector and the German market in particular.

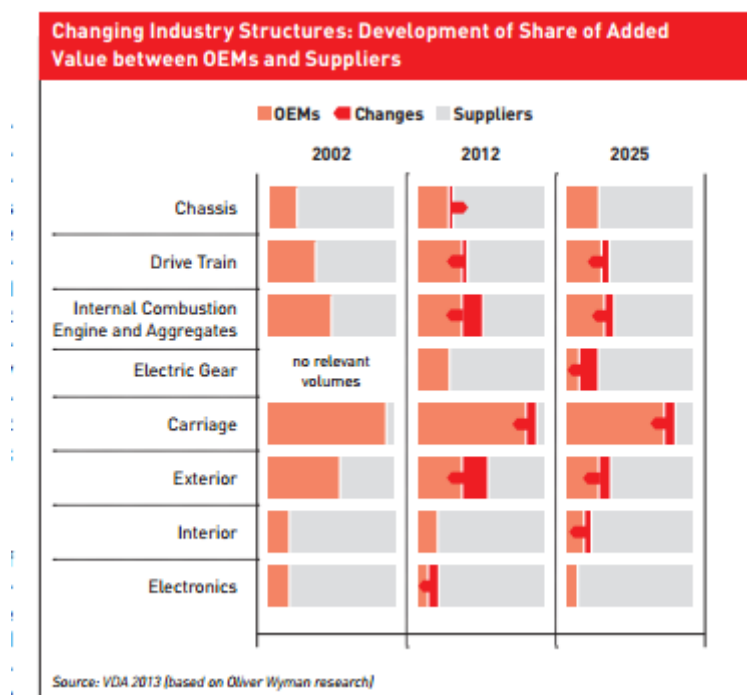
## 2.3 The GVC model in the German automotive industry

The Global Value Chain, as is agreed upon by academics in the field, does contribute to production fragmentation and as a result to more trade between countries. As I have examined in the section before, this holds true for overall trade of manufactured goods. The automotive industry is often taken as an example 'as it is regarded as one of the most fragmented industries' (Türkcan, 2011). Another study published by Faustino (2010), who uses Portugal's automotive industry as an example, underlines the growing importance of vertical-intra-industry trade in the automotive components sector in Portugal. As he stresses about 70% of the income gains remain in the outsourcing country, whereas 30% stay in the country that carries out the outsourced activity. As for the effect of trade agreements a closer look on the 1965 auto agreement was taken by Hummels (1998). After the agreement 'the share of

Canadian vehicles exports to the United States leaped from 7 percent to 60 percent, and the share of the Canadian automobile market consisting of imported cars jumped from 3 percent to 40 percent' (Beigie, 1970, p.4-5).

The German automotive industry is Europe's biggest automotive market in production and sales terms and with a recorded turnover of about 361 billion cars Germany's largest industrial sector (GTAI, 2013). However, Germany is no exception to the developments of the GVC.

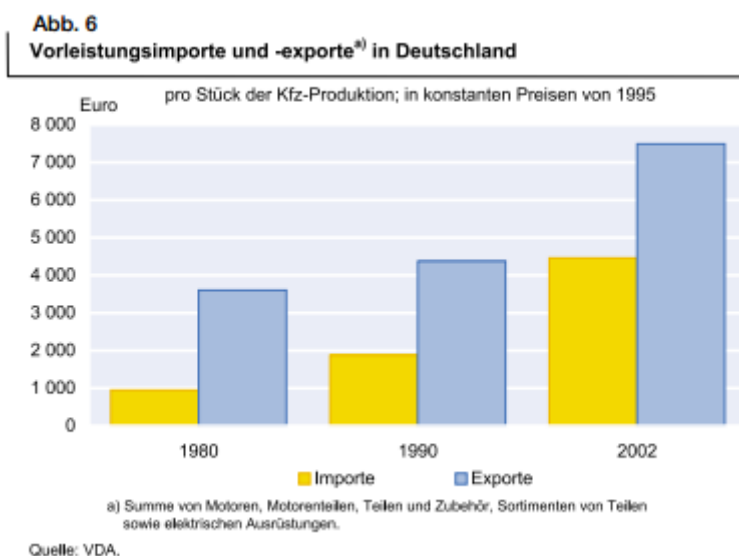
### Changing Industry Structure: Share of Value-added



(Source: GTAI Report, automotive industry, p.6)

The table indicates the way the relationship between the supplier and the Original Equipment Manufacturer (hereafter OEM) changed over the last years. As was also cited by GTAI (2013) the German Association of the automotive industry (VDA) the role of the suppliers in the value chain of the automotive industry changed a lot, giving them a more important position. The picture becomes even clearer if one looks also at the changes in the distribution of German imports over the last years. Nunnenkamp (2002) did a study on the development of imports and exports of cars and intermediates in Germany, which indicated a steep increase in imports of intermediates.

### Imported and exported intermediates in Germany



(Source: Nunnenkamp, P. (2004), p. 32)

As displayed in the table above the imported and exported intermediates used in the production of cars saw an especially high increase after the eastern enlargement. When it comes to the relationship of the GVC and the German automotive industry a clear pattern can be observed. First of all the production of cars got increasingly separated over the years, making suppliers more and more important to OEM's. Second of all, this separation has been going on for the last decades. However, the mid 1990s seem to have had a more than usual effect on the development of the trade of intermediate goods in the industry.

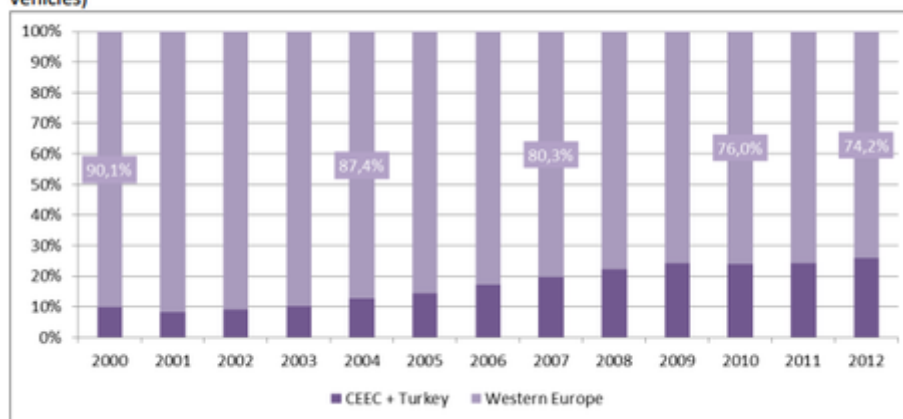
In this section of my analysis I introduced my theory and the concepts I want to use to address the main research question. The different concepts were introduced and their relationship between each other was put in perspective. The next chapter is going to be focusing on the more practical example of the Eastern European countries joining the European Union, which will serve as a baseline for the eventual evaluation of the effect of the coming enlargement TTIP on the German automotive industry.

### 3 How did eastern enlargement effect the competitiveness of the German automotive industry?

#### 3.1 The Eastern Enlargement: An introduction

After the fall of the iron curtain, the race to the east was open. Negotiations flourished and the east was going to be integrated into the EU. This was also anticipated by the automotive industry as many companies opened or reopened production plants in the respective countries. Volkswagen was leading the way when they took over Skoda in 1991, which was primarily located in the Czech Republic. Shortly afterwards other companies followed including Fiat in Tychy (Poland), Suzuki 1992 (Hungary), Ford 1995, Plonsk (Poland) or Opel 1998 in Gliwice (Poland). This lead to an increase in production in the eastern European countries. In 2012 about 25% of all vehicles assembled in Europe came from CEEC countries (plus Turkey). As cited by Frigant (2014) the development mirrored a scissor effect, where an increase in output in the east was accompanied by a decrease in production in the west (Figure 1).

**Figure 1 – Production distribution of all vehicles assembled in Europe (passenger cars and utility vehicles)**



Source: OICA authors

(Source: Frigant, 2014)

This process did not only occur in the production of vehicles but especially in the sector of automobile suppliers (OEMs). According to Walker (1999) in the beginning of the 1990s about one third of the German automobile suppliers were active abroad. This picture changed in the late 1990s. Between 1997 and 2001 25%-38% of the German suppliers relocated their production outside of Germany (Kinkel & Lay, 2005). Especially low-wage jobs fell first into the hands of the restructuring process and were thusly relocated to other countries with a better cost structure. This development has been put to point by Jürgens as



(2006), who stresses that this “out of Germany or out of business” mentality has led to political pressures, especially when it comes to undercutting labour standards aside of the reduction of production costs. He suggests that this could lead to a “lock-down” of the eastern countries as they specialize in low-wage and low-skill production manufacturing, without any realistic chance of upgrading of skills, wages and work conditions. Leaving the critique aside, the development of the race to the east had a considerable influence on the trade relationship as well. As shown below (Figure 4) eastern European countries export share with Germany rose over time. The share of German exports increased from 3.0 percent in 1990 to 9.4 percent in 2006. The respective share of German imports rose from 2.8 percent to 9.8 percent in the same time period.

Trade Integration with Eastern Europe

	Austria						Germany					
	Export Share			Import Share			Export Share			Import Share		
	1990	2001	2006	1990	2001	2006	1990	2001	2006	1990	2001	2006
	in percent											
CEE	5.0	12.2	12.8	2.5	9.7	9.6	3.0	7.8	9.4	2.8	8.8	9.8
SEE	3.2	2.8	4.4	0.2	1.2	2.4	1.8	1.0	1.6	1.8	0.7	1.0
CIS	2.2	1.8	3.4	1.8	2.2	3.0	4.1	2.4	3.7	3.2	3.2	4.8
Total	10.4	16.8	20.6	6.8	13.1	15.1	8.9	11.2	14.7	7.7	12.7	15.6

Source: Statistik Austria, Statistisches Bundesamt

(Source: Marin, 2010)

As much as the table above illustrates the development of the trade integration with the German market as much can be said about the outsourcing activities of German Multinationals. The following table makes use of the data created by a survey carried out between 1990 and 2001, where 660 German and Austrian firms were surveyed about 2200 investment projects. The table below displays outsourcing activities motivated by lower wages in Eastern Europe. As much as 46, 7 percent of the decisions taken during that time span followed that reasoning. Especially eye-catching is the number in the Czech Republic, where 75, 95 percent of all foreign investment activities were related to German multinationals. In the same Article Marin stressed that, after reviewing the numbers displayed ‘some of the eastern countries

like Hungary Poland the Slovak Republic, Romania, and Russia have clearly become new Members in the international division of labour.

In that same direction, Buch and Piazzolo (2001) studied the relationship of the eastern enlargement and trade or the attraction of capital. They as well found that eastern countries (in this case the Czech Republic, Hungary and Poland) attracted significantly more FDI than was to be expected for a non-EU member.

Table 3. Multinationals' Outsourcing Activity to Eastern Europe

	Austrian Multinationals		German Multinationals	
	cases	in percent	cases	in percent
<b>CEE</b>	<b>118</b>	<b>17.12</b>	<b>185</b>	<b>46.68</b>
Baltic States	3	3.11	7	28.43
Czech Republic	36	11.73	77	75.95
Hungary	27	10.19	42	27.18
Poland	20	41.54	38	14.50
Slovak Republic	19	9.94	16	68.71
Slovenia	13	15.49	5	12.44

(Source: Marin, 2010)

As expected the opening up of the market had consequences for the rest of the EU. As shown in the examples above, companies made use of the clear cost advantage in the eastern countries. As much as this development had been foreseen by scholars and politicians, it still affect their economies. The eastern countries did also fit in neatly with the development of the GVC in Europe. The division of labour, as it is often referred to by scholars, changed throughout Europe. Like the southern enlargement in the early 1980s, when Spain and Portugal were incorporated into the European market (Faustino, 2010), following the relocation of production facilities jobs moved as well. Based on the analysis of the outsourcing activities in the 1990s towards the CEEC countries (CEEC in this instance include Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia) Geishecker (2006) found evidence for the decline in demand for manual workers in German manufacturing industries during the 1990s. During the analysis he also found significant differences between skill-levels. Especially low-skilled workers fell under extensive pressure, whereas high-skilled workers had steady growth rates over the years.

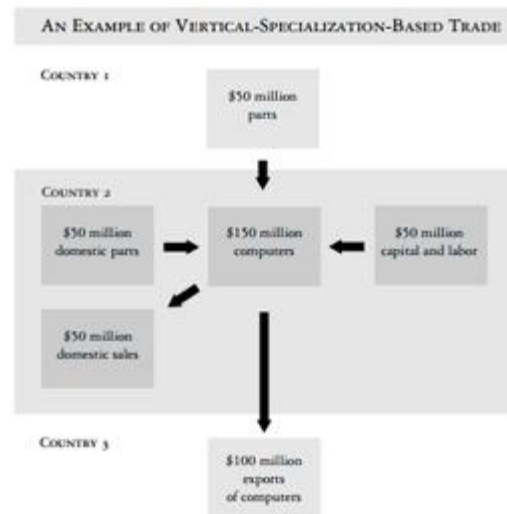
This paragraph was meant to give a general impression on the effect of the eastern enlargement on the European Union. Of course this analysis is not at all complete, with regard to all possible variables. Other variables with a significant influence would be FDI flows (f. ex. Nunnenkamp, 2004; Pavlinek, 2009), productivity (Hansen, 2010) or trade union developments (Bernaciak, 2010), just to name a few. However, the overall pattern is clear. In the following section the analysis of the effect of the eastern enlargement on the German automotive industry will be under study. This analysis will be the main part of my thesis and will form the baseline from where I want to draw my comparison to the enlargement of TTIP.

### 3.2 The eastern enlargement and the automotive industry

This section is meant to analyze the effect of the eastern enlargement on the competitiveness of the German automotive industry. As mentioned several times throughout my thesis I am stressing again the difficulty of measuring competitiveness. Older measures focus on the export numbers, based on a sector by sector analysis (Timmer, 2012). This however does not display the full picture of today's economy. Over the last decades and especially in respect to my analysis, trade agreements changed the landscape market economies have to be analyzed in. Today the division of labour and tasks is what defines the production process. The final product has to be understood quite literally as its value has often been created elsewhere. If one was to judge a nation's competitiveness solely on its exports competitiveness, hence its share of global exports, its role in the production process is overlooked. This narrow focus on goods does not display the full picture of trade in goods. The measure I want to look at does take into consideration the importance of the production process, which is highly divided in today's economies. What Timmer introduced is a measure that 'indicates to what extent a country can compete with other nations in terms of activities related to global manufacturing, rather than competing in manufacturing products (...)' (Timmer, 2012; p.3).

For this analysis I want to introduce the measure GVC income. As explained above, this measure is defined as 'the income of all production factors that have been directly or indirectly needed in the production of the final manufacturing goods' (Timmer, 2012, p.14). So to answer my second sub-question, I first want to analyze in which way the enlargement influenced the vertical specialization of the automotive industry. The vertical specialization represents the division of the production process

which is caused by the introduction of the eastern markets and the respective move of German companies to use the obvious advantages (cost reduction, new markets...) (Hummels,1998).



(Source: Hummels (1998), p.82)

On that note I want to explain the difference between vertical specialization and outsourcing, with special reference to Hummels (1998), as I will focus on the first rather than on the latter. The process of vertical specialization has a focus on a production process where a good is produced in another country and is then imported by as an intermediate for further production or as a final good for final selling. In the other instance, the production process would have been relocated into another country, where the production process is carried out, but neither the final nor the intermediate good is reimported or the other way around, exported. For the concept of the GVC this differentiation is crucial as a process of international trade. As for the German automotive industry this is displayed in the numbers of domestic (German in this case) value-added embedded in final output value. As depicted in the table below. The table is based on the World Input-Output database (2013) and provides a breakdown of the value-added in final output from German transport equipment manufacturing (ISIC re. 3 countries 34 and 35).

**Table 1 Slicing up global value chains (% of final output value)**

	Transport equipment from Germany	
	1995	2008
Domestic value added	79	66
high-skilled labour	16	17
other labour	42	30
Capital	21	20
Foreign value added	21	34
Labour	13	19
Capital	8	15
Total final output	100	100

*Note:* breakdown of the value added to final output from German transport equipment manufacturing (ISIC rev 3 industries 34 and 35).

*Source:* Author's calculations based on World Input-Output Database, April 2013.

(Source: Timmer, 2014, p.104)

The numbers indicate an overall drop, by about 13% from 1995 to 2008, in value-added in Germany. On the other side the foreign value added increased by about 13%, with the steepest increase by the capital employed (about 7%). In Germany the high skilled workers managed a small increase, whereas especially the medium-skilled workers lost a considerable amount of contribution (9%). Overall, Foreign-value added increased in all areas, from low to high-skilled labour. This was also noticed by Timmer (2014) as he mentioned two important developments. The first being the increase of overall capital employed, irrespective of its location (increase by about 6%) and the respective drop of the use of labour. The second development, related to the first, is that the loss of labour is noticed by the low and medium-skilled jobs, whereas the high-skilled jobs do not lose out. This does point into the direction of an overall change of the factor content of the GVC car production.

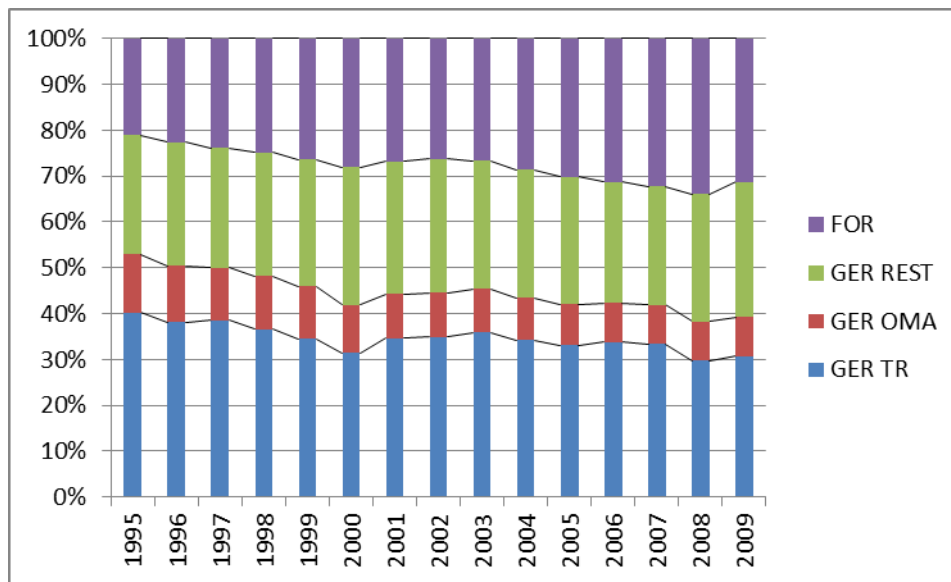
After outlining the increase in foreign value added in German manufacturing it is still unclear, where this the value is created. As shown by the next table a sharp increase by value-added in German transport equipment is displayed by CEE countries. The data was composed using the World Input-Output Data (2013). The data shows the change of the share of input, by the respective country, of the final output in German transport equipment. The period under study compares the numbers from 1995 with the 2008. As is evident, all accession countries increased their share of German final output. From the CEE countries Poland makes up for the biggest share of final output in German transport equipment in absolute terms, whereas the biggest increase has

been witnessed in Lithuania. What is also striking is that Germany itself increased the amount of value added by factor of 1,75, but compared to other countries, this amount is rather small.

Change of distribution of value added in German transport equipment						
Country	1995	2008	factor change			
Germany	93.727,84	164.011,41	1,75			
Cyprus	2,84	35,89	12,63			
Czech Rep	443,61	2.861,40	6,45			
Estonia	6,22	49,90	8,02			
Lithuania	7,20	104,34	14,50			
Latvia	6,50	56,76	8,74			
Poland	547,00	3.695,73	6,76			
Romania	74,36	643,06	8,65			
Slovakia	147,66	1.059,48	7,18			
Slovenia	101,26	407,30	4,02			
USA	2.394,81	5.632,16	2,35			
Source: Authors' calculations on World Input-Output Database (revised April 2012 release).						
Note: Shares in final output value based on national currency to US\$ conversions at market exchange rates.						

In the next section I will find out where the income was generated. For that I will introduce three measure on which I will base my analysis. The indicators are similar to the indicators used by Timmer (2012) and Timmer (2013), but are adjusted in a way to fit my industry needs. The three indicators are measures of competitiveness based on the GVC income approach I mentioned earlier. Hence they are based around the fact, where the income along the value chain was generated and consequently how it changed. The data I will use is retrieved from the World Input Output database, which enjoyed recent rapture and was therefore used by many scholars in the articles. The first indicator I am going to look at is the GVC income per labour unit. In theory competitiveness can be measured and improved if the number of workers in the GVC activities is increased together with their productivity. So the table below is meant to display the GVC income per worker as a measure of labour productivity.

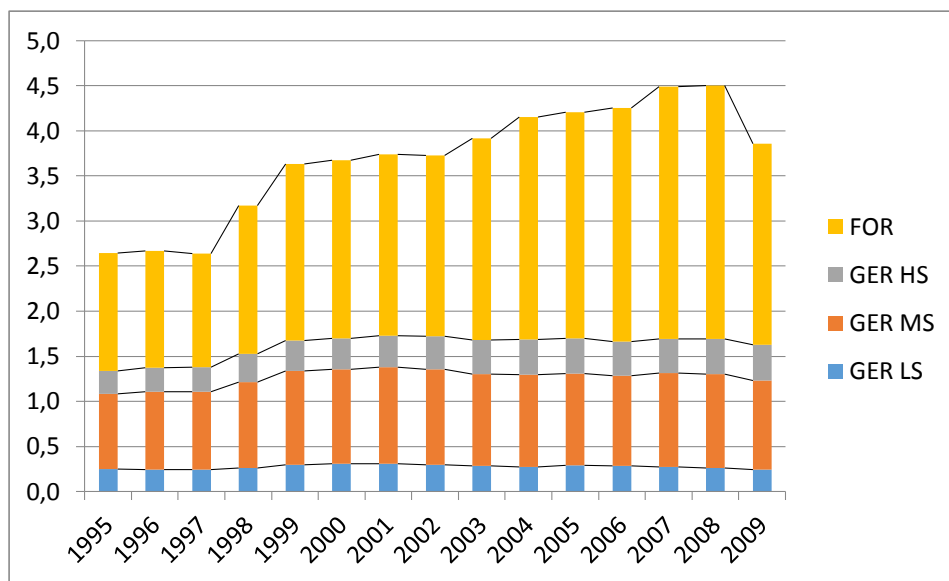
## GVC income shares (in %)



(Source: Timmer, 2013, p.33)

The table shows German income shares in the production of German transport equipment. It displays the development from 1995 onwards, ending up in 2009. Every year is divided into the share of the value added in the production of German transport equipment itself (GER TR), the value added in other German manufacturing industries in the production of German transport equipment, the value added in all German non-manufacturing industries in the production of German transport equipment and finally the share of foreign value added. It is indicative that the share of foreign value added increased from 21% to 34% over the time under study. This development would indicate that overall less workers from German industries are incorporated into the production of German transport equipment. Another interesting development is the increasing share of non-manufacturing industries in the production of German transport equipment. This development, however, is only part of the picture. As stressed by Timmer (2013) the increasing share of foreign products in domestic production does not necessarily lead to a decline in jobs. Due to an increase in demand for German cars the number of jobs has increased as well (1.3 million to 1.7 million) over the same period. As explained by Grossman and Rossi-Hansberg (2008) lower output prices and higher demand for the final output may as well have a positive effect on the job outlook. However it is also stressed that this effect is biased.

## Workers involved in the production of German transport equipment



(Source: Timmer, 2013 p.33)

The graph shows the share of workers in the production of German transport equipment. The share is divided into Foreign workers (yellow), German high-skilled workers (grey), German medium-skilled workers (orange) and German low-skilled workers (blue). Again one might get a wrong impression at first. However, one has to stress that especially low- and medium-skilled workers lost out. With reference to the afore mentioned biased effect, the use of low-skilled workers increased by a mere 6% and the use of medium-skilled workers increased by about 24%. The use of high-skilled workers increased by over 50%. At this point Timmer (2013) points to the increased specialization by advanced nations. As Marin (2006) points out cheap medium skilled technicians as well as low-skilled workers were the main reasons for German companies to offshore to Eastern European countries. In her analysis she stresses that the Eastern Enlargement lead to offshoring, which made German companies leaner and more competitive as they used first of all the cost advantage in the eastern countries and second of all the skilled labour force of these countries to put pressure on domestic wages. 'German firms offshored the skill intensive part of the value chain to exploit the low cost skilled labour available in Eastern Europe. As a result, the demand for this type of labour in Germany was lower, putting downward pressure on skilled wages in Germany. Hence, offshoring improved Germany's



competitiveness by increasing German firms' productivity and by lowering its skilled wages.' (Marin, 2010, 10.06.2015).

Change in real income per worker and number of workers in the manufacturing industry (1995=1)



(Source: Timmer, 2013, p. 39)

The graph above shows the development of workers employed and real wages in GVC manufacturing between 1995 and 2008. 1995 serves as the baseline. As is shown Germany kept its real wages just below the 1995 level, whereas the number of workers employed increased, which does also fit with our findings earlier. As cited by Fagerberg (1988) competitive strength is not only indicated by unit labour costs, but also by the relation of workers employed and relative wages paid. As a negative example one might point to Greece, where relative high incomes are accompanied by a decreasing number of workers employed.

The next measure for competitiveness is GVC income in final demand. As the first indicator(s) were based on a supply side basis, I will now turn to the demand side and see how it was effected.

## Change in GVC income due to production structure/final demand

Change in GVC income between 1995 and 2008			
	Total Change	Keeping production structures constant	Keeping final demand constant
Germany	47,33	111,63	-64,30
Poland	52,26	47,99	4,28
Czech Republic	26,97	23,23	3,74
Romania	20,69	18,58	2,11
Hungary	16,02	14,37	1,65
Slovak Republic	12,56	11,34	1,23
EU 15	305,97	45,52	-149,18

(Source: Timmer, 2013, selected countries)

The table shows the change in GVC income due to changes in final demand or changes in the production structure. Changes in production structure would entail changes in skill-biased technology change, offshoring in intermediate input production, changing geography of input sourcing. On the other side, changes in final demand are quite simply understood as shifting patterns of global demand for final output from the respective industry-country pairs. In the German manufacturing industry, keeping final demand constant would lead to a decline in GVC income. It is argued that this development is due to declining value added shares in GVCs where the final production takes place in the domestic market (Timmer, 2013). Domestically produced intermediates were substituted by imported intermediates leading to a decline in GVC income. Apart from Germany the EU-15 witnessed a similar development, and within those, especially France and Italy joined Germany in the development. As for emerging countries (or developing) ,represented here by Poland, Czech Republic, Romania, Hungary and Slovak Republic, increasing GVC income as noted, which is indicative for their ability to serve global demand. Even though the advanced countries are negatively impacted by the change in production structure, there are benefitting even more from a change in final demand, where an even larger difference is found. As is stressed by Timmer (2012) this indicated that they were even better in making use of the Global Value Chains and the global fragmentation process.

For the last measure I will use a very basic measure of competitiveness, which will be the revealed comparative advantage based on GVC income by product group. The

table below displays the revealed comparative advantage (hereafter RCA) for the 27 EU countries. It is calculated as a countries share in world GVC income for a group of manufactures divided by the same ratios for all manufactures. We have 6 product groups under study, comparing the years 1995 and 2008.

Revealed comparative advantage based on GVC incomes by product, major EU countries, 1995 and 2008

	chemicals		electrical machinery		food products		non-elec. machinery and metal		non-durables		transport equipment	
	1995	2008	1995	2008	1995	2008	1995	2008	1995	2008	1995	2008
Germany	1.10	0.80	0.87	0.95	0.72	0.67	1.37	1.43	0.76	0.65	1.26	1.54
France	1.08	1.08	0.80	0.72	0.99	1.04	0.86	0.93	0.85	0.77	1.38	1.30
United Kingdom	1.30	1.30	0.98	0.81	0.83	0.78	0.99	0.95	0.96	0.90	0.95	1.07
Italy	0.92	0.70	0.65	0.65	0.72	0.75	1.32	1.59	1.95	1.82	0.67	0.76
Spain	0.96	0.89	0.52	0.54	1.17	1.17	0.58	0.85	1.43	1.07	1.16	1.24
Netherlands	1.23	1.40	0.75	0.70	1.31	1.13	0.86	0.96	0.85	0.81	0.68	0.74
Belgium	1.30	1.30	0.67	0.69	0.96	0.95	0.95	1.04	0.99	0.87	1.16	1.05
Sweden	0.88	0.85	1.18	1.16	0.76	0.65	1.19	1.49	0.61	0.61	1.29	1.26
Austria	1.03	0.74	0.90	0.97	0.91	0.76	1.24	1.61	1.22	0.94	0.68	1.01
Greece	0.87	0.99	0.31	0.41	1.82	1.62	0.21	0.63	1.82	1.47	0.30	0.40
Denmark	0.99	1.42	0.70	0.90	1.43	1.09	1.03	1.20	1.02	0.75	0.47	0.52
Finland	0.74	0.70	1.26	1.56	0.97	0.77	1.22	1.50	0.75	0.63	0.62	0.75
Ireland	1.27	1.69	1.21	1.37	1.47	1.05	0.44	0.45	0.46	0.47	0.33	0.45
Portugal	0.81	0.76	0.50	0.64	1.04	1.06	0.53	0.72	2.69	2.22	0.54	0.71
Poland	0.92	0.84	0.51	0.60	1.42	1.25	0.73	0.92	1.33	1.09	0.72	1.03
Czech Republic	0.88	0.61	0.60	0.97	1.13	0.81	1.27	1.25	1.16	0.90	0.84	1.51
Romania	0.87	0.76	0.49	0.45	1.55	1.35	0.75	0.76	1.55	1.48	0.54	1.06
Hungary	1.20	1.10	0.62	1.28	1.47	0.94	0.64	0.90	1.09	0.60	0.68	1.18
Slovak Republic	1.23	0.60	0.62	1.18	1.09	0.66	0.88	1.24	1.26	0.92	0.79	1.39

(Source: Timmer, 2013)

The revealed comparative advantage displays a countries advantage vis-à-vis other countries with respect to a certain industry. This is of importance if one was to identify in which sector countries specialize. For policy implications it is useful to determine, which industry possess the competitiveness to survey in an enlarged market if it would be exposed to it following the establishment of a trade union. Mauro and Foster (2008) found that, over the last decades, countries in the euro area did not change in their pattern of specialization as opposed to other advanced countries. In this table a share of country high than one indicates a pattern of specialization as the country derives a higher share of its GVC income from the production of this good. As for Germany it stands out that they have two clear-cut product groups with a relative advantage. Non-electrical machinery and metal products as well as transport equipment products. They used to have an advantage in chemical products, but it dropped immensely. For the other product groups they more or less stagnated, but did not develop an advantage. For highest increase is found for transport equipment

where it increased from 1.26 in 2008 to 1.54 in 2008. For the eastern countries, located at the bottom of the table, all seem to have specialized in the transport equipment sector and all but two lost out on their previous stronghold sector (food sector). A specialization of all countries in the transportation equipment sector might come a surprise as it seems unlikely that the rest of the world lost its shares to the European economies. Gereffi (2005) gives an explanation in his analysis of European production networks. He points to the fact that firms try to focus on high-value activities rather than low-value activities. Focusing on R&D expenditure and workers employed in related jobs Pavlinek describes a similar picture in which knowledge and service intensive tasks are focused on by German manufactures.

Manufactures GVC workers, 1995 and 2008, by sector

	Manufactures GVC workers as (%) share of all workers in the economy		Manufactures GVC workers in 2008 (in thousands) employed in				Change in manufactures GVC workers between 1995 and 2008 (in thousands) employed in			
	1995	2008	Agriculture	Manufacturing	Services	All sectors	Agriculture	Manufacturing	Services	All
Germany	26.8	26.4	400	5,481	4,766	10,647	-161	-666	1,388	561
France	22.0	18.7	303	2,195	2,355	4,853	-96	-423	368	-151
United Kingdom	20.1	12.6	115	1,946	1,931	3,992	-128	-1,148	-347	-1,624
Italy	29.1	25.5	333	3,553	2,559	6,444	-192	-234	517	91
Spain	23.2	17.5	271	1,827	1,494	3,592	-97	185	353	440
Netherlands	22.8	19.0	89	643	929	1,661	-42	-87	158	29
Belgium	25.0	20.9	31	399	503	933	-18	-86	72	-32
Sweden	22.7	21.0	36	481	443	959	-23	-49	94	22
Austria	24.8	22.6	104	463	393	960	-46	-35	120	40
Greece	21.0	15.0	97	374	247	717	-202	17	34	-151
Denmark	23.9	19.6	41	271	257	569	-25	-66	51	-41
Finland	23.6	19.7	39	248	211	498	-25	-12	51	14
Ireland	31.5	18.8	59	168	168	394	-35	-17	40	-11
Portugal	28.9	21.7	191	602	343	1,136	-57	-139	20	-176
Luxembourg	20.3	17.4	1	23	36	61	-1	1	16	17
all EU15	24.4	20.4	2,110	18,674	16,632	37,416	-1,149	-2,758	2,936	-971
Poland	31.0	28.8	917	2,278	1,347	4,542	-468	81	368	-19
Czech Republic	30.8	30.9	93	990	553	1,636	-59	74	35	50
Romania	34.0	27.6	684	1,388	517	2,588	-356	-222	-68	-646
Hungary	31.6	29.3	129	675	400	1,204	-145	13	63	-69
Slovak Republic	28.2	29.6	22	392	249	663	-35	19	85	69
Other EU12	29.0	24.2	362	1,121	616	2,098	-86	-217	98	-205
all EU12	31.2	28.0	2,207	6,844	3,682	12,732	-1,150	-251	580	-820
Total EU 27	25.9	21.9	4,316	25,518	20,314	50,148	-2,298	-3,009	3,517	-1,791

(Source: Timmer, 2013)

The table displays the share of workers, who are directly and/or indirectly involved with the production of final manufacturing goods in the respective country. The table

is divided into three sections. The first one on the far left displays the change in GVC workers in manufacturing as a share of total workers in the economy. The second part in the middle is about the GVC manufacturing workers employed by sector and the third part on the far right is about the change in GVC manufacturing workers employed in the different sectors from 1995 to 2008. Basically this table shows, how the different sectors are divided when it comes to manufacturing. What catches the eye immediately is that the service sector notes a sharp increase in the GVC of manufactures in Germany. The manufacturing sector, on the other side, is declining. As for the eastern countries, the picture is a little different as their primary focus is on the decline in the agricultural sector. Of course this is due to the restructuring and the technological advancements after the accession to the EU (Pavlinek, 2009). Furthermore does the manufacturing sector not display as much of a decline as is displayed in the German manufacturing sector. This might be part of the explanation, why many countries seem to have specialized in the transport equipment sector. As indicated by Timmer (2013) the German industry might focus more heavily on high-skilled tasks in the value chain of the manufacturing industry. To be sure one would need disaggregated data on the different sectors (in this case GVC workers in manufacturing as part of the German production in the transport equipment sector).

In this section I focused on the analysis of the effect of the eastern enlargement on the competitiveness of the German automotive industry. To do that I used three different indicators put forward by Timmer as a new measure of competitiveness based on the GVC approach. The next section will focus on the comparison between the TTIP agreement and the Eastern Enlargement. Accompanied by that, the German automotive industry specialized in the production of products with a need of high-skilled workers.

## 4 How will the reduction of tariffs and non-tariffs barriers influence the competitiveness of the German automotive industry?

This next and last part of my analysis will deal with the effect of the reduction of tariffs and non-tariff barriers on the competitiveness of the German automotive industry. First I will introduce the TTIP briefly as I already talked about in the introduction. The second part will compare the TTIP agreement with the Eastern Enlargement. Basically this is a comparison of the economies that have been or will be incorporated into the European Market. The third section will then give an outlook on what we will have to expect from the agreement with respect to its effect on the German automotive industry.

### 4.1 TTIP: an introduction

The TTIP agreement negotiations are aimed at concluding an ambitious, comprehensive and high-standard regional trade and investment agreement that offers significant benefits in terms of promoting international competitiveness, jobs and growth in the partner countries (Karmaker, 2013). The CEPR study carried out by Francois (2013) estimated that a comprehensive agreement could bring significant economic gains for the EU as a whole, which could equal up to 155.1 billion a year up to 2027. That, however, depends on the level of harmonization and tariff reduction. The agreement is also expected to increase global income by about 130 billion USD as a result of increasing bilateral trade. Together the EU and the US account for about half of global GDP and a third of world trade. The size is also displayed by the 2.7 billion worth of goods and service which are traded every day between the two. Approximately 80% of the gains would be generated by an abolishment or reduction of administrative barriers and legal harmonization, so called Non-tariff Barriers (hereafter NTBs). Tariffs are rather low on average, about 4%, however especially protectionist measures on agriculture can cause high costs on both sides. Similar peaks are found for several other goods, like a 10% tax on light trucks. Nevertheless and as mentioned before, the main focus is on harmonization of NTBs and legislation to protect companies from high administrative costs and unnecessary bureaucracy. These can impose costs of about 10-20% on goods. In today's highly competitive value chains. The tasks is huge though as the two parties



have been discussing matters for years. There are reason for the existing barriers as both sides have strong, vested interest in domestic regulations. Nevertheless some achievements have been made like the Partnership on Organic Trade (2012), EU waiver on exports of Active Pharmaceutical Ingredients from the US (2013) or the US acceptance of EU commuter and high-speed train safety rules (2013). The Transatlantic Economic Council, which had been set up in 2007 to facilitate negotiations, has the mandate to discuss and guide the harmonization of e-vehicles, ICT trade principles, innovation and action partnership or nanotechnology just to name a few. Even though negotiations have been going on and progress seems to be made, sensitive areas such as automotive safety does seem to be delayed on purpose. Especially due to stagnating negotiations on the global level (WTO rules), FTAs like TTIP could lead the way for more international harmonization and standardization to foster trade liberalization and consequently trade. The aim is thusly to mutually accept standards and harmonize rules. As the case of automotive security standard shows this is easier said than done. What would have to be achieved is that both sides mutually accept safety standards agreed on in the other respective country. This should of course not be meant to reduce standards all together, but to keep high standards on a mutually accepted basis. If they could agree on regulatory compatibility of specific, mutually agreed on goods and services it would turbo-charge competitiveness vis-à-vis third countries in the world economy. This bodes especially important with the rising powers in the east. As the EU already experienced several extensive agreements, the past experiences are a building block for do's and don'ts. It is obvious that an extensive agreement like the European Internal Market is not feasible, which would mean to agree on the same standards. As for the automotive safety sector negotiators from the European Commission already agreed upon the fact that even though safety standards on lights, door locks or electric windows are subject to differing safety standards, a similarity is visible (Karmaker, 2013). This is indicative for a scenario in which both country could formally accept product safety regulations of the respective other. As from a global value chain perspective, about one quarter of all EU exports in value-added terms were destined for consumers in the US (2009). One fifth of all EU imports in value-added terms were sourced from the US and the share of service in EU value-added exports to the US stood at about 60% (Galar, 2013).

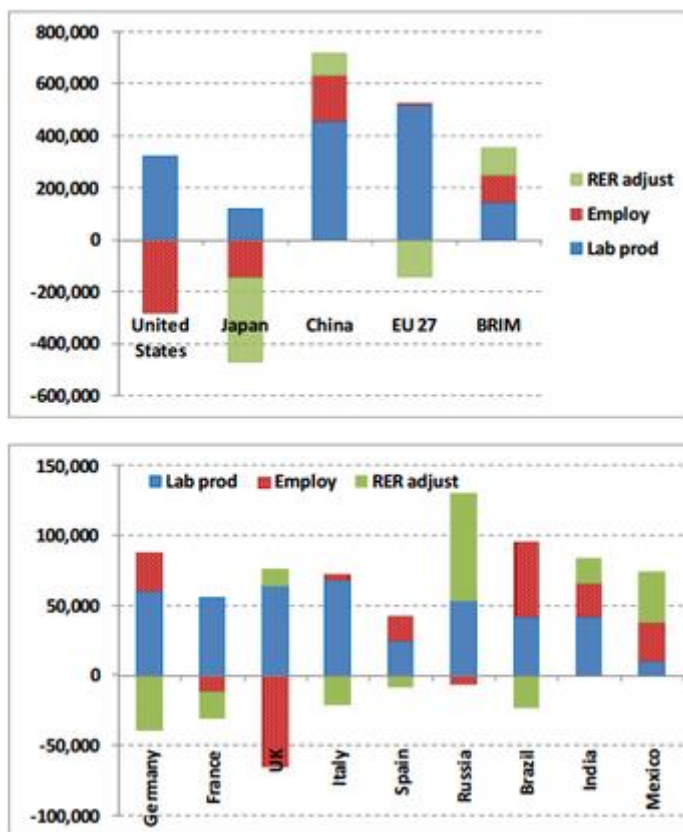
As one can see this agreement has a huge upside, which does unfortunately come with almost unsolvable problems. In the end we will have to wait and see what the negotiations will bring.

## 4.2 The United States and the Global Value Chain

This section will focus on the current situation of the United States and the Global Value Chain.

First of all I want to look at the fragmentation of production of the United States. The share of Real GVC income due to foreign demand increased from 25, 9% to 33%. Following this trend in US production, the Global Foreign Value Added Share of its final output increased by about 6 percentage point from 1995 to 2008. Those numbers are very similar to the numbers we found previously for Germany. The next numbers I want to take a look at are displayed in the figure below.

Change in GVC income by source (in million 1995 US\$), between 1995 and 2008

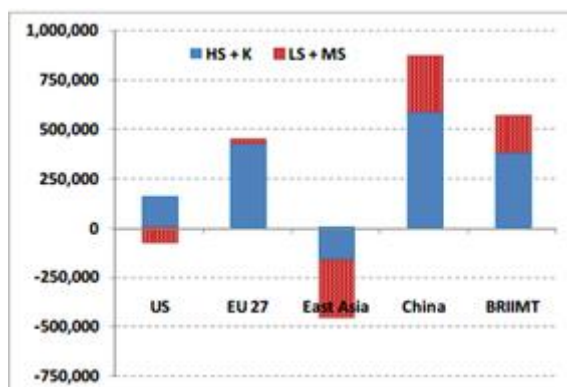


(Source: Timmer, 2012, p.34)



As is indicative by the numbers above the German and the US have similar developments when it comes to the change of GVC income. As both seem to have increased labour productivity. For the US however, a huge decline of GVC income due to decreasing employment number is noted, which is the exact opposite in Germany. The next table will again show the similarity of the development of the two countries in the GVC income.

#### GVC Income by production factor



(Source: Timmer, 2012, p.33)

The numbers are again similar. The US witnesses a decline in low-skilled as well as medium-skilled workers, whereas the high-skilled workers and the capital employed enjoy increasing numbers since 1995.

This brief comparison gave a little outlook on, how the US developed over the period under study with respect to its role in the GVC. I find that its development can be compared with the German development, much rather at least than with the Eastern European Countries. The next section will be now focus on the effect of TTIP on the Competitiveness of the German automotive industry.

### 4.3 TTIP and the German automotive industry – the scenario

After studying the effects of the Eastern enlargement on the German automotive industry, the final comparison has to be drawn to the TTIP agreement and its effect. This is highly speculative as its conclusion does still pose several barriers, which itself seem to be almost impossible to claim. I explained the difficulty of the negotiations in the first section of this last part. For my comparison I will have to look on how the enlargement would influence the indicators I used as measures for the competitiveness of the German automotive sector. The first indicator would be the workers employed in the GVC. Here I want to point to the work of the Bertelsmann Stiftung (2013), who did an extensive study on the effect of TTIP on the German workforce. They project, that jobs will be created in all sectors especially in subsectors where value creation and exports are high. (Metal production, electronics industry and motor vehicle and machine construction). The study estimated an increase for high-skilled workers of about 12.5 %, 14.2 % for low skilled and 73.3 % for medium-skilled workers. Another thread to the GVC income for workers as used in the analysis could be the so called brain drain/gain. This is created by high-skilled workers immigrating to the accession country due to f. ex. better living conditions. A study has not been conducted, which is also stressed by a study of the European Parliament (2015). They stress that the overall impact on high-skilled worker is too small to suggest a potential brain-drain. What has been under steady scrutiny is whether or not labour standards are included in the agreement. Germany has a rather inflexible system with high labour protections. It has been stressed by German politicians that those standards and especially the social welfare systems, which are even highly sensible within Europe, remain untouched. This is to mention as the US system is more competitive, in its hire and fire nature. This outcome, however, is not to be expected.

The second measurement I used was the GVC income due to final demand. I found that a change in the production structure would have an immense influence on the GVC income. The effect of TTIP should only be positive in that direction. As production costs should fall, due to the abolishment of tariffs and non-tariff measures it will be easier for the German manufacturing industry and the German automotive industry to serve final demand in other countries due to higher cost competitiveness. Furthermore the figure displayed high substitution effects of foreign intermediates,

which should also improve. The German automotive industry will still heavily rely on importing intermediates, as this was the way they adopted to competitive pressures when the eastern countries joined the European Union.

The third measurement was the Revealed Comparative Advantage. As I have shown the German manufacturing industry significantly increased their comparative advantage in GVC income in the transport equipment industry. The theory would suggest that (vertical) specialization would increase competitiveness. As defined by Chen (2005) three conditions would have to be met for vertical specialization to occur. These are first of all that goods have to be produced in multiple, sequential stages, second of all two or more countries provide value-added in the goods production sequence and at least one country must use imported inputs in its stage of the production process.

The effect of TTIP on German exports/imports

	Imports			Value added imports		
	Base	TTIP	Change (%)	Base	TTIP	Change (%)
EU27	665	631	-5	373	348	-7
China	78	75	-5	55	55	1
USA	77	271	253	60	162	169
EFTA	73	72	-1	40	39	-2
East Asia	56	51	-8	45	43	-3
Eurasian Customs Union	42	44	4	35	35	0
ASEAN	34	33	-3	24	24	0
Middle East & North Africa	22	23	3	19	20	2
Turkey	17	16	-3	12	11	-4
MERCOSUR	16	16	1	13	14	3
South Asia	14	14	1	11	12	2
Pacific Alliance	13	12	-3	11	13	18
Central Asia	7	8	2	6	6	-1
Southern African Customs Union	7	7	1	5	5	0
Sub-Saharan Africa	6	7	2	7	7	7
Rest of Europe	6	6	-1	4	4	-3
Oil exporters	6	6	6	12	12	5
Canada	6	6	6	6	9	42
Australia & New Zealand	5	5	5	6	6	3
Latin America & Caribbean	5	5	3	4	4	7
Rest of World	2	2	4	1	1	4
Oceania	1	1	7	1	1	3

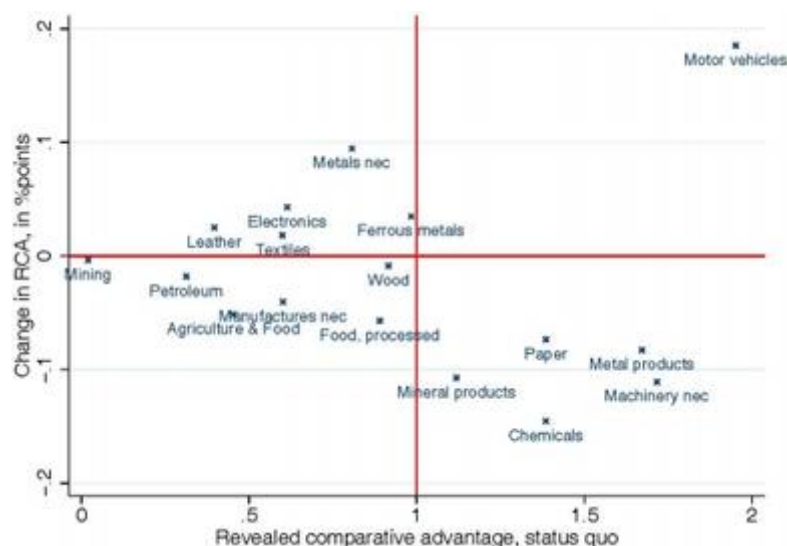
  

	Exports			Value added exports		
	Base	TTIP	Change (%)	Base	TTIP	Change (%)
EU27	807	743	-8	514	462	-10
<b>USA</b>	<b>111</b>	<b>351</b>	<b>216</b>	<b>106</b>	<b>249</b>	<b>136</b>
EFTA	65	63	-3	37	35	-5
China	54	51	-6	40	37	-7
Eurasian Customs Union	48	47	-3	39	37	-6
East Asia	47	43	-9	36	33	-8
ASEAN	25	24	-7	17	15	-7
Middle East & North Africa	25	24	-4	21	20	-6
Oil exporters	25	24	-4	19	18	-5
Turkey	21	20	-4	17	15	-8
MERCOSUR	15	14	-5	13	13	-5
Pacific Alliance	15	14	-7	12	12	2
South Asia	15	14	-5	15	14	-6
Canada	11	10	-9	10	11	12
Australia & New Zealand	11	11	-4	10	10	-5
Central Asia	11	11	-3	9	8	-6
Southern African Customs Union	11	10	-3	8	7	-6
Rest of Europe	10	10	-1	9	8	-6
Sub-Saharan Africa	9	9	-4	9	9	-6
Latin America & Caribbean	4	4	-4	4	4	-1
Rest of World	1	1	0	1	1	-4
Oceania	1	0	-6	1	0	-8

(Source: Aichele et. al., 2014, p. 16/17)

The tables display the effect of the TTIP agreement on the change in export/imports as well as the change in value added in exports/imports of Germany with respect to countries on a global basis. Imports by Germany from the US are set to increase by 253% and the value added in US imports is going to increase about 169%. As for US exports, numbers are set to jump by 216% and value added in export is set to increase by 136%. As shown in the table exports as well as imports are going to increase substantially, which does also count for the value added content of exports and imports. The table does not show, where the goods are finally consumed or whether the exports contain value added from third countries. Aichele et. al. (2014) stresses the fact that VA exports do not increase as much as exports, which is indicative for a change in the structure of value chains, meaning Germany would source more inputs from the US. As for imports the effect is even higher. The increase in imports from the US is accompanied by an increase in imports from other regions and a decrease of imports from EU countries. More studies have been conducted on this matter and some find similar results. Fonatgé et. al. (2013) stresses an income scale effect as production and incomes increase in Germany the same is bound to happen with intermediate inputs, raw materials and the consumption of goods and services. Those numbers would suggest an increase of vertical specialization in Germany.

Change in Germany's structure of revealed multilateral comp. advantage through TTIP



(Source: Aichele et. al. 2014, p. 20)

As the numbers of value added imports and exports only gave an outlook for the German economy as a whole, the figure above also indicates an increasing comparative advantage for the German automotive industry (measured by the Balassa-Samuelson index of revealed comparative advantage). This is confirmed by the numbers I found above.

This last part was meant to analyze the effect the TTIP agreement will have on the competitiveness of the German automotive sector. This final part was built upon the work of the previous section, the analysis of the effect of the eastern enlargement on the German automotive industry, as a baseline for comparison. In the last part of my thesis I want to sum up my findings and answer my research question.

## 5 Conclusion/ Recommendation

In this paper I used a novel measurement of competitiveness as a way to predict the economic impact of the TTIP agreement. In the analysis I posed the research question:

*“To what extent is the likely conclusion of the Transatlantic Trade and Investment Agreement (TTIP) going to effect the competitiveness of the German automotive industry?”*

To answer this question I proposed three sub-questions in which I explained and used a novel measure for competitiveness, GVC income, which gained in recognition over the last years.

I found that during the period under study, the German automotive industry changed in a way to obey to the competition of the global manufacturing industry or respectively the automotive industry. It was rightly said that the automotive industry is one of the most fragmented industries. To stay competitive companies in the automotive industries used the possibility of the cost advantages, which opened up when the eastern countries joined the EU. Companies in the industry moved production facilities abroad and imported the labour intensive parts of the car. This lead to an increase in workers employed accompanied with a decrease in earnings. The outsourcing had the highest impact on medium-skilled workers and well as low-skilled workers, whereas high-skilled workers benefited from the move up the value chain. It was also shown that the increase in foreign value added in the production lead to more imported intermediates, which made production leaner and more competitive. As a result the RVC in transport equipment indicated a specialization pattern. This specialization, however, was mainly away from the traditional manufacturing towards more service oriented work as indicated by the value added of services in the manufacturing industry. All in all one can say that the German automotive industry improved competitiveness, as they moved up the value chain.

To answer my main research question will still be a difficult task. First of all the problem with the scenario does pose uncertainty. Up until now we can only try to make predictions and recommendations on how the negotiations will play out. In my analysis I assumed an extensive agreement. This is mainly for reasons of simplicity, but also for the comparison as my baseline was the eastern enlargement, which was

a very extensive agreement of course. As for my predictions, it seems that an extensive reduction of tariffs will indeed improve the competitiveness of the German automotive industry by means of specialization in the GVC. This however has to be enjoyed with caution as too many assumptions had to be made.

My results show an overall positive impact and are meant to be understood that way. However, when it comes to TTIP many angles have to be taken into consideration. First of all, it is important to note that this analysis does only include the automotive sector. The business sector has been busy stressing the positive effects of an extensive agreement as it is supposed to increase wealth and create jobs. As much as this might be true, one has to point at the uneven distribution of the effects. When it comes to Germany, as an example, especially high-skilled workers will benefit from TTIP whereas low-skilled jobs are outsourced. This might lead to more work in eastern countries, being the place where the work is outsourced to. When it comes to wages, my findings indicate a negative effect for workers overall, especially in the manufacturing sectors. Bearing that in mind, as for the EU as a whole, Francois (2013) stresses that an extensive agreement generally creates spill-overs. Direct and indirect spill-overs also affect third countries. Due to the size of the European and the American sector this effect will be relatively large. On the same note, it is important for the EU and the US to set standards for the future. As is indicated by Francois (2013) the automotive sector will have the best chances to transform falling tariffs and NTBs into economic gains. Once those standards are used in 50 percent of the world, it is very likely the rest will adapt over time, which is important when we consider rising nations like the BRIC countries.

This paper is meant to be a building block for further research. As much as the scholars in the article stresses it also have to point to the lack of data. The WIOD database is a great start but data on country specific sectors is still missing. Therefore I have to admit that many charts do either not focus on the exact same product group (transport equipment; motor vehicle industry or have different time frames. As for some tables the only data available was on overall manufacturing products. As this is helpful for the bigger picture, exact answers lack accuracy. Therefore future research would be needed, using a more comprehensive database.

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