RESEARCH OF THE GERMAN AUTOMOTIVE INDUSTRY

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Abstract. *The title of the following research is "Research of the German automotive industry". The German automotive industry and its well-being and growth is a key sector of the German economy. Therefore it is of importance to analyse this industry. The aim of this research is to provide an analysis of the German automotive industry and its growth. The tasks to achieve the set aim are as follows: turnover, production of motor vehicles and passenger and the strategy of internalization of the German automotive industry. The primary methods used in this research are: logically constructive method, analysis, descriptive method, document study and descriptive statistical methods. Based on these methods the turnover, production of motor vehicles and passenger and the strategy of internalization of the German automotive industry is analysed.*
This research shows that the German automotive industry constitutes a growth industry between 2005 and 2015. Furthermore, it shows the importance of the strategy of internalization of the German automotive industry for its growth: the two-pillar strategy which consists of production on site an export. Due to the fact that the export numbers are stagnating on a high level in recent years the future focus of the German automotive industry should be set on the production abroad.

Keywords: *domestic production, export, German automotive industry, production abroad, two-pillar strategy*
JEL code: *L62*

Introduction

In the world, the global automotive industry is a key sector for many major country's economies. According to the International Organization of Motor Vehicle Manufacturers (OICA), the global production of motor vehicles amounted to 90.78 million units in 2015. (OICA, 2016) The consulting company A.T. Kearney estimates the contribution of the automotive industry to the global gross domestic product (GDP) at roughly 3%. (A.T. Kearney, 2013) The global GDP in 2015 amounted to USD 73.43 trillion. (World Bank, 2016) Consequently, the global GDP of the automotive industry amounted to around USD 2.2 trillion. These production numbers and global GDP of the automotive industry show that the global automotive industry is essential to the functioning of the global economy and a key driver to the well-being of the world population.

The German automotive industry is of crucial importance in terms of surplus value and employment, not only in Germany but also in Europe. At this point it is important to mention that the German Automotive Industry and the Automotive Industry in Germany are not the same thing. The German

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Automotive Industry does not only comprise the economic activities in Germany but also the worldwide activities of German automotive companies such as production of cars abroad. This means that the worldwide production of the German Original Equipment Manufacturers (OEM) VW, BMW and Daimler is part of the German automotive industry. And vice versa foreign automotive companies which produce in Germany are part of the automotive industry in Germany. (Deutsche Bank Research, 2014)

The aim of this research is the analysis of the German automotive industry. The object hereby is the German automotive industry and the subject is factors which influence the German automotive industry. The main tasks to achieve the set aim are as follows: turnover, production of motor vehicles and passenger cars ("Passenger cars are motor vehicles with at least four wheels, used for the transport of passengers, and comprising no more than eight seats in addition to the driver's seat.") (OICA, 2016) and the strategy of internalization of the German automotive industry. The research period is from 2005 to 2015.

The Hypothesis of this research is: The German automotive industry constitutes a growth industry.

To achieve the aim of this work the following methods are used: logically constructive method, analysis, descriptive method, document study and descriptive statistical methods.

Turnover of the German automotive industry

In Germany, the automotive industry is the largest component of the manufacturing sector and generates around 20% of its overall turnover. The automotive industry includes the production of motor vehicles, the production of trailers and bodies and the production of automotive parts and accessories. (VDA, 2016) The companies that make up the German automotive industry had a cumulative global turnover of EUR 404.8 billion in 2015. (Statista, 2016) This turnover is higher than that of any other industry sector in Germany. The next two largest sectors are mechanical engineering (EUR 236 billion) and the food and animal food industry (EUR 148 billion). Even the turnover of these two sectors combined is lower than the turnover of the automotive industry. (Statistisches Bundesamt, 2016) The total turnover of the automotive industry grew by EUR 97.1 billion from 307.7 billion in 2006 to EUR 404.8 billion in 2015 which is a percentage increase of 31.6% which constitutes a compound annual growth rate of 3.1%. (Statista, 2016)

Figure 1 shows the domestic turnover and the turnover abroad of the German automotive industry from 2005 to 2015. Around two thirds of the turnover, EUR 263.4 billion, are generated abroad, predominantly in the

European Union. The domestic turnover amounted to EUR 141.3 billion. (Statista, 2016)

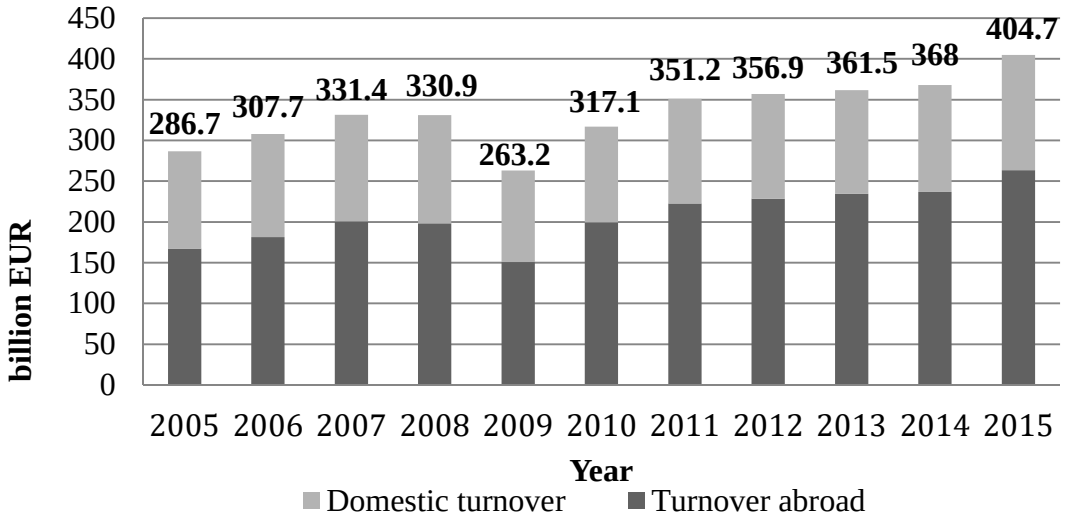

Fig.1 Domestic turnover and turnover abroad from 2005 to 2015 in billion EUR
(Source: Statista, 2016)

Manufacturing of motor vehicles generated around 78% of the overall turnover, EUR 318.6 billion. The production of trailers and bodies generated EUR 10.4 billion and the production of automotive parts and accessories EUR 75.8 billion. (VDA, 2016)

This high turnover of the German automotive industry proves that the automotive sector is crucial for the German industrial sector and the German economy. Furthermore, it is shown that the largest part of the German automotive industry is the production of motor vehicles, which has a share of more than three quarters of the overall turnover. It is interesting to mention that the German automotive industry generates more turnover abroad than in Germany. This shows the German automotive industry's high dependence on the international market.

Production of motor vehicles and passenger cars

In the automotive industry, it is common to measure the economic development based on produced, sold or newly registered units. This unit-based measurement has the advantage that the data can be collected based on time intervals, for instance on a monthly basis. Furthermore, it is relatively easy to collect data. The disadvantage, however, is that there is no differentiation in quality or value between the different types of vehicles such as the distinguishing between luxury cars or compact cars. This is why the real index of production is a better indicator to measure the economic

development of the automobile industry. It takes into account the differences between value and quality as well as suppliers' production in Germany.

For the countries of the European Union Eurostat calculates the index of production of the automobile sector. Furthermore, data on production is available. This way, information on different countries can be compared.

However, analysis of the difference in production between German automobile producers in Germany and abroad is limited to the calculation by the number of units because that is the only data available abroad. Furthermore, by this measure, the index of production by country does not take into consideration origin of the producing companies operating in any given country. (Deutsche Bank Research, 2014)

The heavy international reliance on German production companies is neglected when using this index. German producers manufactured 15.1 million passenger cars worldwide. Compared with 2014, this was an increase of 1.3%. Within Germany 5.7 million units were produced. Abroad 9.4 mill. units were built. (Statista, 2016)

Production of motor vehicles and passenger cars in Germany

Germany is one of the largest motor vehicle producers in the world. Measured by production number, Germany was the fourth largest producer in 2015 with an output of 6.0 million vehicles. Germany accounted for around 7% of the world´s motor vehicle production. Regarding the European Union 27 (excluding Croatia), Germany has a share of 28% and is the largest producer in the EU followed by Spain (2.7 mill.) and France (2 mill.). (OICA, 2016) (Statista, 2016)

In comparison to the production number, the real index increased faster. This indicates increase in product quality in the automotive industry in Germany. In 2013 the production of vehicle units was 15.5% higher than in 1991. However, the real index of production was 81% higher in 2013 than it was in 1991. The underlying reason for this development were value based quality improvements of the cars such as more qualitative interior fittings, for instance. (VDA, 2016) (Deutsche Bank Research, 2014)

As mentioned above, 5.7 mill. out of the 6 mill. motor vehicles produced in 2015 were passenger cars. (OICA production statistics, 2016) Since the German reunion in 1990, the automobile production in Germany has grown from 4.7 mill. to 5.7 in 2015, which was an increase of around 21%.

In 2015, 4.4 mill. passenger cars were intended for export. This is an export rate of 77%. This means that 77% of the automobiles produced in Germany were sold to other countries. (VDA, 2016)

On the other hand, many elements and components are imported from other European countries. The surplus value share of European suppliers of an average car produced in Germany is more than 40%. (VDA, 2014)

Facilities and production of passenger cars abroad

The worldwide motorization rate has constantly increased since 2005. And especially in emerging economic regions such as Asia or South America, motorization rates in most countries are higher than average. (OICA, 2016) This means that individual mobility grows worldwide. Furthermore, trade barriers between certain countries distort competition. This negatively impacts the export sector and the consumers in import markets. Due to growing individual mobility, trade barriers and increasing globalization, German automotive companies have built factories in foreign countries and continue to do so. (Bundesministerium für Wirtschaft und Energie, 2016) There are over 2,000 production facilities of the German automotive industry all over the world. Since 2010 more passenger cars have been produced abroad by German producers than in Germany itself. In 2015, 9.4 million units were produced abroad. The complete on-site manufacturing process of German business groups, also known as "Konzerne", constitutes 62% of their overall production of passenger cars. The nation with the highest production outside Germany is China with 4 mill. passenger cars.

In European countries, 3.3 mill. units are produced. The production in the NAFTA countries amounted to 1.2 mill. and in South America to 0.5 mill. In South America, the production registered a decline in 2014, due to a recession in Brazil. (VDA, 2014) Most of the growth in production through the German automotive groups is generated in foreign countries, not in Germany. (VDA, 2016)

Comparison: production abroad and domestic production

Production abroad gained increasing importance in the last few years and is an integral part of globalization and a long-term strategy of German global players in the automotive industry. In 2000, production abroad amounted to 4.2 million units. (VDA, 2016) In the period from 2000 to 2015 production increased about 124% to 9.4 million units. This is a compound annual growth rate of 5.16%. Due to the fact that the interior fittings of the produced cars abroad constantly improve, the qualitative increase should be even higher than the growth of units.

In contrast to production abroad, domestic production increased in the period from 2000 to 2015 by only about 12%. Since 1998 the production has always been above 5 mill. units with the exception of 2009, due to a

worldwide recession. (VDA, 2016) Domestic production stagnates on a high level - above 5 mill. units per year - with slight deviations depending on economic activity.

Between 2010 and 2012 the difference between domestic and production abroad was particularly high. In 2010, production abroad surpassed domestic production for the first time. Figure 2 depicts the production of passenger cars abroad and in Germany in 2015. The production abroad was 65% higher than domestic production.

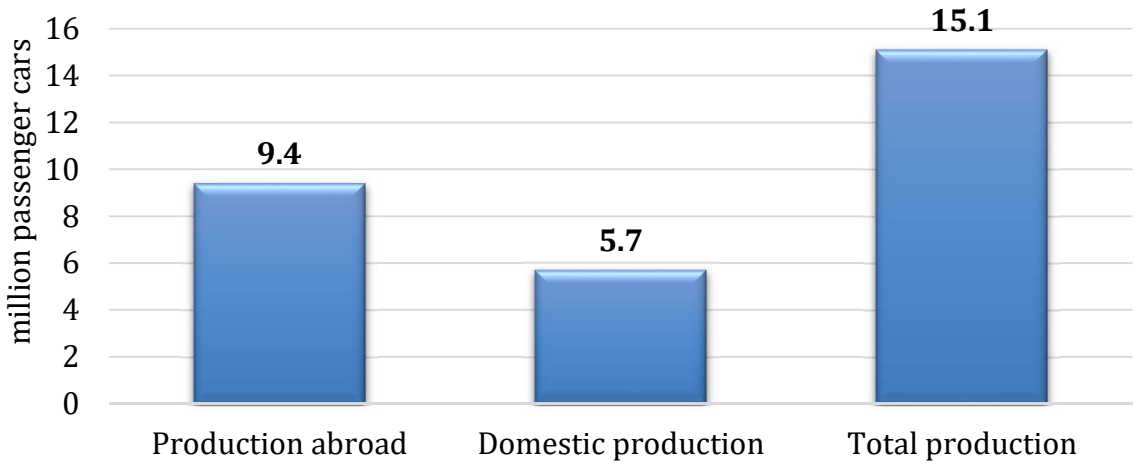

Fig. 2 Domestic turnover and turnover abroad from 2005 to 2015 in billion EUR
(Source: VDA, 2016)

This was mainly due to the creation of new production facilities and an increase of the production abroad following the global economic crisis in 2009. These effects apply especially to China and the NAFTA region.

These numbers and economic development underscore the production activities of German automobile companies abroad and its importance. (Deutsche Bank Research, 2014)

Two pillar-strategy of the German automotive industry

The German automotive industry acts globally. An important key to success of the German automotive industry is its strategy of internationalization. The export figures and numbers of produced passenger cars abroad show that trade with foreign countries and the production abroad are crucial for the German automotive industry. The German automotive industry was able to assert itself against international competition in recent years. In the largest car markets such as Western Europe, China and the U.S., German companies were able to increase or at least maintain their share of the licensing of new passenger cars. Twenty

years ago, following the economic boom of German reunification, the automobile sector in Germany slid in a depression. Experts and market observers had predicted a negative future of the German automobile industry then. In this light, the positive development since then is noteworthy. This success was achieved because the product range fit the demands of the consumers. Passenger cars made by German corporate brands are considered as world leaders in safety, capacity, comfort, diversity, design, reliability and image. (Deutsche Bank Research, 2014)

The globalization strategy of the German automotive industry is based on a two pillar-strategy: export and localization.

Export

In 2015, 4.4 mill. passenger cars were exported. (Statista, 2016) This number constitutes two thirds of the overall production of cars in Germany. This means that two thirds of turnover are generated by export. The value of the exported vehicles and vehicle parts in 2015 was EUR 226 billion. Vehicles and vehicle parts amounted to the highest value of export products, followed by machines (EUR 170 billion) and chemical products (EUR 108 billion). (Statista, 2016) Overall, the automotive industry's share of all of Germany's exports was about 19%. (Statista, 2016) These qualitative and quantitative numbers highlight the German automotive industry's dependence on exports.

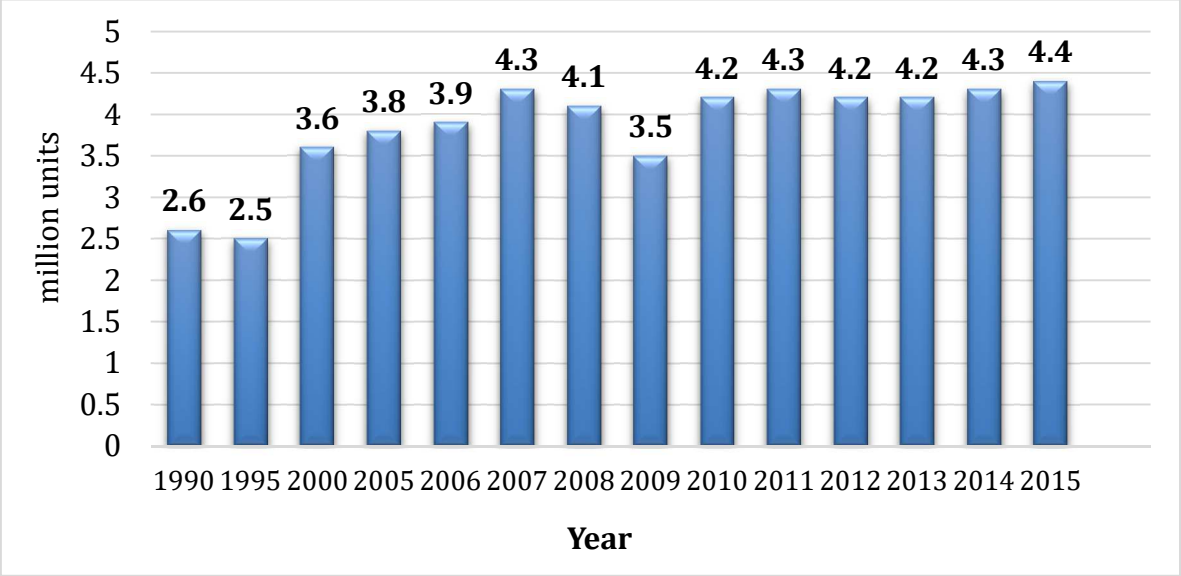

Fig. 3 Development of the German export of passenger cars
(Source: Statista, 2016)

Figure 3 depicts the development of the exports of passenger cars. The number of German passenger cars grew by 70% from 1990 (2.6 mill.) to

2015. However, for a few years now, the export numbers have been constant with only small increases. For example, the number of exports of passenger cars in 2007 amounted to 4.30 mill. Compared with the year 2015, this means an increase of 2.6% in eight years.

Furthermore, the year with the highest export numbers was in 2011 with 4.52 mill. exported passenger cars. (Statista, 2016) Demand is increasingly satisfied by production on-site in places like China.

Most of the exported cars, 63%, go to other European countries, 2.8 mill. units. Out of this number 2.4 mill. are exported within the European Union. The second biggest export market is America where 17% of the exported passenger cars are sold. Sixteen per cent of passenger cars are sold to Asia, while Africa as well as Australia and Oceania receive 2% each of the exported cars. (VDA, 2016)

Localization

Trade barriers complicate the exports in some countries and lower the competitiveness of the location Germany. For example, the customs and import duties in India are higher than 100%. Many countries try to protect or increase their own local surplus value through high import and production requirements. This is a reason why production abroad is crucial for the German automotive industry.

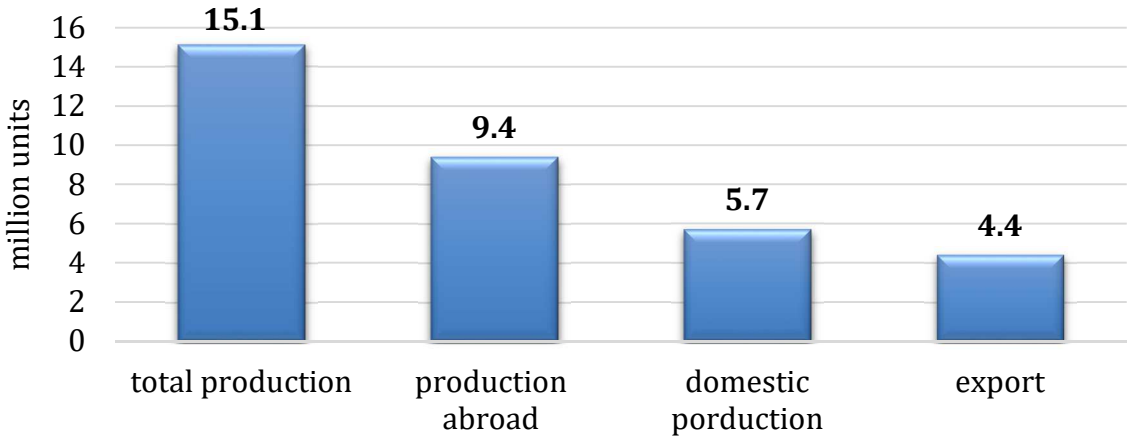

Fig. 4 Production and export overview in 2015
(Source: VDA, 2016)

The second pillar besides export is the production on-site, the localization of the German automotive industry abroad. As mentioned above, more German-made cars are produced abroad than in Germany: 9.3 million abroad and 5.6 mill. in Germany. There are also over 2,000 production facilities abroad. Additional parts of the localization process abroad are the development of new markets and the diversification of preliminary work.

Many parts and components are bought abroad. Especially in the 1990s, producers outsourced many components of their surplus value chain to suppliers and other upstream sectors abroad. Thereupon the gross surplus value of the production value decreased from 33% in 1991 to around 25% in 2001. In 2011, the gross surplus value of the production came to around 25%. (Deutsche Bank Research, 2014) Four of the top ten import countries in this sector are eastern European countries: the Czech Republic, Hungary, Poland and Slovakia. The main import countries, however, are Spain and France. (Deutsche Bank Research, 2014) Furthermore, car producers and suppliers have been increasing their production activity abroad. Because of this, the numerical production of passenger cars of German companies abroad has increased and the domestic production has stagnated on a high level. The automotive sector has also doubled down on research and development activities abroad. (Deutsche Bank, 2013)

A recent Deutsche Bank study suggests this trend of localization and the production through German car producers abroad will continue in the future. (Deutsche Bank Research, 2014)

Conclusions and suggestions

Hypothesis was proved to be true. The hypothesis: the German automotive industry constitutes a growth industry was proved to be true. The German automotive industry constituted a growth industry in the research period 2005 to 2015.

Significance of the automotive industry for the world economy. The automotive industry is a key sector for the world economy. The global production of motor vehicles amounted to 90.78 million units in 2015. The contribution of the automotive industry to the global gross domestic product (GDP) is estimated at roughly 3% which equates to around USD 2.2 trillion in 2015. In the global perspective, the automotive industry constitutes a growth market. The regions with the highest production are Asia-Oceania, Europe and the NAFTA states. The countries with the highest production are China, the U.S., Japan and Germany. The biggest OEMs worldwide are Toyota and VW.

Significance of the German automotive industry. The German automotive industry is of crucial importance in terms of surplus value and employment, not only in Germany but also in Europe. In Germany, the automotive industry is the largest component of the manufacturing sector and generates around 20% of its overall turnover. German producers manufactured 15.1 million passenger cars worldwide in 2015. Within Germany 5.7 million units were

produced. Abroad 9.4 mill. units were built. In 2015, 4.4 mill. passenger cars were exported.

Globalization strategy of German OEMs. Two pillar-strategy of the German automotive industry. The German automotive industry acts globally. An important key to success of the German automotive industry is its strategy of internationalization. The export figures and numbers of produced passenger cars abroad show that trade with foreign countries and the production abroad are crucial for the German automotive industry. The German automotive industry was able to assert itself against international competition in recent years. In the largest car markets such as Western Europe, China and the U.S., German companies were able to increase or at least maintain their share of the licensing of new passenger cars. Twenty years ago, following the economic boom of German reunification, the automobile sector in Germany slid in a depression. Experts and market observers had predicted a negative future of the German automobile industry then. In this light, the positive development since then is noteworthy. This success was achieved because the product range fits the demands of the consumers. Passenger cars made by German corporate brands are considered as world leaders in safety, capacity, comfort, diversity, design, reliability and image.
The globalization strategy of the German automotive industry is based on a two pillar-strategy: export and localization.

Focus of the German automotive industry should be set on the production on site. This proposal is addressed to German OEMs which are economical worldwide active. The focus of the strategy of internationalization should be led on the two-pillar strategy. It was proven to be successful and is essential for the growth of the German automotive industry. However, the export numbers are stagnating on a high level. This means that the future potential for the German automotive industry is lying in the production abroad. There exist various growth markets worldwide like China, India or Mexico. In these areas, the German OEMs should increase their investments and production on site.

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