

**Czech University of Life Sciences Prague**

**Faculty of Economics and Management**

**Department of Economics**



**Diploma Thesis**

**Foreign Trade Analysis of Automotive Industry  
Case study of the Czech Republic**

**Bc. Petr Čepelka**

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# CZECH UNIVERSITY OF LIFE SCIENCES PRAGUE

Faculty of Economics and Management

## DIPLOMA THESIS ASSIGNMENT

Bc. Petr Čepelka

Economics and Management  
Economics and Management

Thesis title

**Foreign Trade Analysis of Automotive Industry – Case study of the Czech Republic**

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### Objectives of thesis

This diploma thesis analyses automotive industry and its foreign trade. The main objective of the paper is to assess importance of the automotive trade for the Czech Republic and its economy. The partial goal is to evaluate social and economic impacts of the automotive industry in the Czech Republic. The general context of the international trade is review in the theoretical part of the thesis. The practical part examines vital characteristics of Czech trade within an automotive industry and investigates potential threats for automotive industry in the future.

### Methodology

The literature review of the diploma thesis is processed on a basic of available books and scientific articles related to foreign trade and other vital economic terms associated with the subject. In the practical part descriptive statistics is used in order to establish graphs and statistical tables.

## The proposed extent of the thesis

50 – 60 pages

## Keywords

Automotive industry, GDP, Employment, Foreign Trade, Economy, WTO, Trade Theories

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MACHKOVÁ, H. – ČERNOHLÁVKOVÁ, E. – SATO, A. *Mezinárodní obchodní operace*. Praha: Grada, 2014. ISBN 978-80-247-4874-0.

MAITAH, M. – ČESKÁ ZEMĚDĚLSKÁ UNIVERZITA V PRAZE. KATEDRA EKONOMIKY. *Macroeconomics : issues and exercises*. V Praze: Česká zemědělská univerzita, Provozně ekonomická fakulta, 2017. ISBN 978-80-213-2748-1.

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### **Declaration**

I declare that I have worked on my diploma thesis titled "Foreign Trade Analysis of Automotive industry – Case study of the Czech Republic" by myself and I have used only the sources mentioned at the end of the thesis. As the author of the diploma thesis, I declare that the thesis does not break any copyrights.

In Prague on 29.3.2021

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# **Foreign Trade Analysis of Automotive industry**

## **Case study of the Czech Republic**

### **Abstract**

This diploma fundamentally focuses on the Czech Republic's foreign trade, particularly on the automotive industry and its importance for the Czech country. The main goal is to analyse the foreign trade of the Czech Republic with vehicles. The thesis is divided into two parts. The first part provides the foundation for foreign trade's theoretical background, its evolution, theories, and automotive industry introduction. The following part, practical, initially examines the automotive industry's history for its export, import, and production for the Czech Republic. Additionally, the paper analyses how important is the industry for employment, stability, and economic development in the Czech Republic. Moreover, the paper analyses future challenges such as electromobility, autonomous transportation, and pressure to decrease emissions and their impacts on the industry and economy of the Czech Republic.

**Keywords:** Foreign Trade, Export, Import, Trade of Balance, Automotive industry, Employment, Electromobility, Industry, Production

# **Analýza zahraničního obchodu s automobily**

## **Případová studie České republiky**

### **Abstrakt**

Diplomová práce je zaměřena na zahraniční obchod České republiky, zejména na zahraniční obchod s automobily. Hlavním cílem této diplomové práce je provést analýzu zahraničního obchodu České republiky se zaměřením na automobilový průmysl, který patří k pilířům České ekonomiky. Práce se skládá ze dvou částí. Teoretická část, definuje zahraniční obchod a související pojmy, dále také historický vývoj zahraničního obchodu a jeho základní směry. Druhá část, praktická, se nejprve zabývá vývojem automobilového průmyslu jeho vývozem a dovozem z pohledu České republiky. Práce sleduje vývoj ukazatelů obchodní bilance, produkce, zaměstnanosti na jejichž základě tato práce analyzuje důležitost průmyslu v návaznosti na ekonomiku, zaměstnanost a stabilitu země. Následně práce analyzuje budoucí trendy jako elektro mobilitu, sdílené autonomní cestování a snižování emisí a rozebírá jejich vliv na automobilové odvětví.

**Klíčová slova:** Průmysl, Obchodní bilance, Export, Import, Produkce, Elektro mobilita, Automobilový průmysl, Zaměstnanost, Zahraniční obchod

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## List of abbreviations

ACEA.....	European Automobile Manufactures' Association
AIA.....	Automotive Industry Association
ECSC.....	European Coal and Steel Community
EU.....	European Union
GATT.....	General Agreement on Tariffs
GDP.....	Gross Domestic Product
IMF.....	International Monetary Fund
NAFTA.....	North American Free Trade Agreement
PPF.....	Production Possibility Frontier
WB.....	World Bank
WTO.....	World Trade Organization

# 1 Introduction

The integration of economies into a global system has been one of the essential developments of the last century. This process of integration, called Globalization, has materialized in remarkable growth in trade between nations. Suppose one country opens up to the trade, demand, and supply of goods and services in the economy shift. Undoubtedly the international transactions have an impact on households, both customers and wage earners. The implication is that Globalization influences everyone from industrial workers to consumers who purchase imported goods.

The Czech Republic is a small-sized country located in the middle of Europe; therefore, international trade is essential for its economy and stability. Trade Balance is one of the features that measure the effectiveness of the economy. The Czech Republic's goal is to export greater value than value imported; then, the country has positive trade balance. The Czech Republic is prosperous in having a positive trade balance because its market is very open towards other nations. The most considerable proportion of the trade is made with our neighbour countries such as Germany, Poland, Slovakia followed with rest of the states within Europe.

Undoubtedly, one of the Czech economy's backbones is the automotive industry, where the tradition goes back to 1898. Since then, the industry has been emphasizing its importance for stability in the country. The automotive industry is one of the pillars of the Czech labor market. It is considered a critical industrial employer. Thanks to international trade, the industry's Czech performance does not end at Czech Republic's borders. However, the industry is undergoing many vital changes that significantly transform the entire sector due to urbanization, demographic, technological progress, and mainly climate changes.

The thesis is divided into two main parts. The first part provides the theoretical background of international trade and covers fundamental terms and foreign exchange theories. Moreover, the first part of the paper introduces automotive manufacturing and its history. This thesis's practical part examines the Czech Republic's automotive sector and its impacts on its economy, employment, and stability. Lastly, the paper investigates potential future threats and challenges that could negatively impact the industry.

## **2 Objectives and Methodology**

### **2.1 Objectives**

This diploma thesis analyses automotive industry and its foreign trade. The main objective of the paper is to assess importance of the automotive trade for the Czech Republic and its economy. The partial goal is to evaluate social and economic impacts of the automotive industry in the Czech Republic. The general context of the international trade is review in the theoretical part of the thesis. The practical part examines vital characteristics of Czech trade within an automotive industry and investigates potential threats for automotive industry in the future.

### **2.2 Methodology**

The literature review of the diploma thesis is processed on a basic of available books and scientific articles related to foreign trade and other vital economic terms associated with the subject. In the practical part descriptive statistics is used in order to establish graphs and statistical tables.

### 3 Literature Review

#### 3.1 International Trade

Foreign trade has been trend within the economy for thousands of years. However, despite its history the vitality of the trade was modest until the beginning of 19th century when overall summarization of global export and import never exceeded 10 percent of global output before 1800. Since, then International trade has been vital pillar of majority of the economies globally. Today, approximately 66 percent of all produced goods and services are traded across the borders of its origin. Since, then International trade has been playing very important part in terms of economic growth, stability and poverty reduction (Ortiz-Ospina, 2018).

Foreign trade is changing services, commodities, and technologies essentially, which boost benefit in two ways. Thanks to international trade, countries have an extensive market outside the country and ensure the best and good exporting goods (Krugman, 2012). According to former professor of economics Trent J. Bertrand: *'International trade and the accompanying financial transactions are generally conducted for the purpose of providing a nation with commodities it lacks in exchange for those that it produces in abundance; such transactions, functioning with other economic policies, tend to improve a nation's standard of living. Much of the modern history of international relations concerns efforts to promote freer trade between nations'* (Bertrand, 2018).

International trade is the exchange of goods and services among the countries. Total trade including both poles import, and export was calculated at 19 trillion USD in 2019. According to Kimberly Amadeo more than 25 percent of good traded are electronics, machinery, computers and scientific goods. Approximately about 12 percent of trade covers automobiles and other forms of transportation followed by oil and fuels that have 11 percent of share. Lastly, there are chemicals covering 10 percent of international trade (Balance, 2021).

### **3.1.1 Purpose of International Trade**

A fundamental objection of international trade is focused directly on import and export goods which are somehow essential for living between trading countries. Every single country has different needs, desires and resources. In order to fulfil its desires countries, have to trade goods and services among each other. Let's illustrate the purpose of foreign trade on following example. Majority of nations do not have access to natural resources such as gas and oil. This need for its resources force the country to find a way how to get it and the solution is represented in form of import. On the other hand, the country that is importing gas or oil will likely be exporting their resources at beneficial price (Mansoor, 2017).

### **3.1.2 Advantages and disadvantages of foreign trade**

In today's globalization world foreign trade play's vital role in our lives. However, some economics, politicians and extended public have different view on international trade. To better understand weakness and positive outcomes by foreign trade.

#### **3.1.2.1 Advantages**

- Development of backward nations

It is statistically proved that developing countries gain from international trade the most. On the open market these countries are able to import machinery and capital goods. On the other hand, these countries could be selling agriculture products or their raw materials.

- Availability of commodities

Thanks to international trade people can get access to products at lower prices. Normally foreign goods are imported because of their relative cheapness in comparison with the prices of domestic products. Moreover, imported goods give more option for consumer to choose from. Likewise, foreign trade allows to countries to acquire commodities that would not be able to be produced in the country due to its resources or other production factors. For example, the machinery is easy produced in more developed countries than in developing countries, just because the trade these countries could afford to buy the machinery.

- Advantages of specialization and division of labor

In other words, different regions across the world have different labor capacity and effectiveness. It is to the advantage of each nation to focus on producing goods for which their factor equipment is most suited. For example, climate conditions in Ethiopia allow coffee beans to be harvested, therefore, Ethiopia is fourth biggest exporter of coffee beans in the world. Country that has special advantage of production special good should be producing it and importing article that is cheaper than producing that.

- National well-being

For many developed and developing countries international trade play's vital role that is literally matter of life or death. Let's imagine Japan that is not self-sufficient in terms of producing food. However, due to many things such as technological progress and labor supply Japan is consider as one of the vital trading partners. Moreover, in let's say war times international trade is matter of existence as well. Let's say that during a war time trade enables to people of country to maintain themselves though import of food, clothes, medicine or weapons to be protected.

- Reduces monopolistic exploitation

If we can imagine close economy just with domestic market where let's say just firm dictates the conditions, quality and price level of specific product. This would be possible if the firm that is doing so, has monopolistic position on the market. So, basically the company can do whatever wanted because people would buy it anyways.

In a case of international trade this is not likely to happen that often. There are no fear of monopoly and competition makes the producers keep the prices at a lower rate (Accountlearning, 2019).

### 3.1.2.2 Disadvantages of International trade

- Exhaustion of Essential Materials

It could happen that country that is desperate for income may cause the exhaustion of materials and minerals of a country. So, most of the resources were exported abroad.

- Affects domestic establishments

International trade could be very beneficial for consumers, but it could be very harmful for country due to import of cheaply manufactured and at times harmful commodities. For example, that cheap that domestic firms are not able to compete with imported goods. This could lead that one country is fully focused on specialization and one-sided economic development. This one-sided development could be very harmful in long term for a country.

- Dependence on other nation

Through international trade standard of living has been improving, however, this standard of living makes the country dependent on foreign markets not for raw materials, but for already manufactured goods or services (Accountlearning, 2019).

## 3.2 Evolution of foreign trade

Exchanging services and goods within different people is an age-old practice. However, in terms of international trade we usually refer to exchanging things and services between different nations (Bertrand, 2018). Over the last 20 decades humans have experienced drastic changes in population growth, technological progress and mainly increased standards of living across the world. Approximately 200 years ago people lived three times less as long as we live now despite that population has risen by sixfold. Unprecedented economy activity and human capital get to the point where people cannot live where there are no jobs that bring income into the families. Overall, on average domestic economies has been growing slower comparing with international trade growth (Van de Berg, 2017).



Following table 1 just proofs this phenomenon of international trade that has been captured from 1820 until 2014. Back in 1820 world export has been estimated at 7.255 dollars (millions of dollars in 1990) that was equal just 1 percent of export of world GDP. In other words, just about 1 percent of manufactured goods and services were sold in abroad economies. In 1870, countries started decreasing tariffs and restriction implied by many countries, therefore, the percentage of export increased by 3.6 percent estimated at 50.345 million USD. Almost 5 percent of whole production was designated for foreign markets. Nearly one year after start of First World War world started falling into Great Depression (Van de Berg, 2017).

Table 1: World Export and Per Capita Gross Domestic product, 1820-2014

<i>Year</i>	<i>World Exports (millions 1990\$)</i>	<i>World GDP (millions 1990\$)</i>	<i>Exports as % of World GDP</i>	<i>Per Capita GDP (\$1990)</i>
1820	7,255	694,442	1.0	667
1870	50,345	1,101,369	4.6	867
1913	212,425	2,704,782	7.9	1,510
1929	334,408	3,696,156	9.0	1,806
1950	295,621	5,336,101	5.5	2,114
1973	1,690,648	16,059,180	10.5	4,104
1990	3,456,762	27,076,007	12.8	5,154
2007	17,170,533	54,273,887	31.6	7,000
2014	23,204,664	77,868,000	29.8	10,000

Source: Van de Berg, 2017 – page 11.

However, still in this time export was 9 percent of the whole market. The rapid shift in the trend came in before 1950 after the big events that impacted the whole planet. Especially Great Depression, World war one and World war two export had fallen under 6 percent due to events that caused the economic stagnation for nearly twenty years. However, since 1950 the market and economic growth increased by six times and world exports increased nearly twentyfold. Economists claim that the growth of trade is closely linked with growth per capita real GDP. The table 1 shows that after 1950 economics across the world did well that caused economic growth matched by growth in trade (Van de Berg, 2017).

### **3.2.1 International Investment and Finance**

Foreign investments captured cash flows from one country to another country. Those areas that belong under international finance are foreign direct investment and currency exchange rates. Today's globalized world has significant importance of international finance (Kagan, 2020). In last decades international borrowing and lending have grown rapidly. Based on the Hendrik Van Den Berg one of the reasons for growth in international investments is that since Industrial Revolution level of wealth has been growing rapidly. Another very important thing that led foreign investments were needs for complex assets such as banks, stock markets, bonds, legal system and financial rules. International finances is not modern phenomena. Countries has been exchanging their capital for centuries. Especially, in era of growing immigrant countries as Australia, United States, New Zealand and Canada. However, the first World War damaged all international transactions among the states. It took almost 50 years after World war to financial investments to recover from Great Depression. However, in the middle of 1990 the situation has reached the point where it was before the war. International investments were not focused on multinational firms as it is today (Van de Berg, 2017).

Modern trend is connected with globalization, where multinational companies invest enormous money into companies abroad. This is the consequence of globalization more companies have branches across the world in many different companies. There are some comparative advantages such as labor, productivity etc. However, the big cooperation's are constantly trying to find the countries with lower tax rates, so they can get favorable tax laws known as heaven (Kagan, 2020).

### **3.2.2 Migration**

Alongside with international trade, international investment and finance is international migration very important part of globalization. Basically, it is the consequences of globalization. Nevertheless, migration is the oldest form of international economic integration as it is described by economists Mr. Hendrik Van Den Berg: *'hunters and gatherers continually walked to new regions that were more fertile or where there was less competition from other humans. The massive movement of people from labour-abundant and land-scare Europe to European colonies in the Western Hemispheres between 1500 and the present stands out as one of the greatest mass migrations'* (Van de Berg, 2017).

At the beginning of 16<sup>th</sup> century after Columbus has discovered America labour force became very important commodity. Therefore, approximately 10 million African slaves were brought against their will to America as very demanded commodity. As well as migration is correlated with foreign trade that decreased its volume during the Great Depression in 1930 after second World War (Zinn, 2015). However, as economies across the world healed that the numbers of people started moving across the face of the earth to seek for better opportunities. In these days, immigration is very controversial. Thus, it has very significant impact on economy, political and social impacts. However, in a case of international trade and finances and investments immigration covers all sorts of negative and positive impacts on economy and community in particular country (Van de Berg, 2017).

### **3.3 Country and firms-based theories**

To better understanding of the modern theory and international trade we have to acknowledge how countries traded among each other in the past. For many decades economists have been searching for the patterns in foreign trade. Until today there is strong disunited opinion of function of foreign trade and its advantages. Historically, there are many theories that belong under the term classical. These classical theories are mainly

country-based. Through the evolution in 20<sup>th</sup> century more modern approach took a place. The approach has been described as firm-based theory.

### **3.3.1 Classical theories**

#### **3.3.1.1 Mercantilism**

In 16<sup>th</sup> century to the 18<sup>th</sup> century Mercantilism was economic system based on that world's wealth was static and the system was dominated Western European policies. The main goal of this system was to enrich the country by promoting export and restraining import. National wealth was correlated with gold, silver and other commodities. The country would be rich either if they can produce natural resources or by export therefore having favorable balance of trade. During this time of economic system military conflict were more frequent than any other time in the history. Most of the policies were to outgrowth the other countries. In other words, if one country wins other side has to lose (Van de Berg, 2017). One of the main figures of this economies thinking was Thomas Mun who had stated advantage of re-exports. By re-export Thomas Mun meant that one country import commodities that are transformed by domestic labour and then exported to another countries with higher value. *'Wee must ever observe this rule, to sell more to strangers yearly than wee consume of theirs in value'*, was expressed by economist Thomas Mun (Mun, 1630).

#### **3.3.1.2 Adam Smith**

In one of the most fundamental books on economies *The Wealth of Nations* Adam Smith refused that the wealth of nations is measured by its treasury. Smith criticized mercantilism approach. His main argument was that foreign trade could be beneficial for both involved parties. If countries tend to produce things in which they are effective, so they can produce it for lower costs. Thus, countries could export these products into countries which are not effective in producing particular product. Based on Smith thinking country should import goods which can be produced cheaper abroad than in domestic economy. Adam's Smith publication set the beginning for the economy thinking and this book is considered as mark the end of the mercantilist era (LaHaye).

### 3.3.1.3 Comparative advantage

*'Gold and silver, like other commodities, have an intrinsic value, which is not arbitrary, but is dependent on their scarcity, the quantity of labour bestowed in procuring them, and the value of the capital employed in the mines which produce them'*, Ricardo says in his book on the principles of Political Economy and Taxation (Ricardo, 1951).

However, having comparative advantage does not necessarily mean to be best at something. Mr. Ricardo explains the problem that was raised even by Adam Smith. One explanation may be that country that has an absolute advantage at something does not have to mean that country focuses on this strong advantage. For example, India was the leading country of supplying of phone – answering despite the English language barrier. However, English speaking countries have absolute advantage in the English language, despite this absolute advantage these countries have figured out that they can use their potential on more profitable sectors. (LaHaye) There always be some industry where another country will have lower opportunity costs and therefore comparative advantage. (Gillespie, 2016)

Table 2: Comparative advantage

Commodities	Units of production in terms of labor	
	In the Czech Republic	In Hungary
Vehicles	11	14
Aircrafts	9	10

Source: Created by an author

If the Czech Republic wants to produce vehicles it costs them 11 units compared to 14 units in Hungary. As well as, producing aircrafts in the Czech Republic costs 9 units of costs compared to 10 units in Hungary. Therefore, we can claim that Czech Republic has absolute advantages in both stocks. Although, Hungary does not have any absolute advantage it does not mean that there is no chance for international trade. It is still possible that Hungary will be able to trade to do a comparative advantage. To find out we have to calculate it as follows: the respective price of vehicles is determined by aircraft production  $11/9$  in The Czech Republic,  $14/10$  in Hungary. As a result, we obtained that vehicles production is cheaper in the Czech Republic; however, aircraft production is relatively

cheaper in Hungary. Hence, Hungary should be focused on aircraft production and The Czech Republic on vehicles production.

One of the most complex explanation of comparative advantage was illustrated by James Mill: *'The cost at which a country can import from abroad depends, not upon the cost at which the foreign country produces the commodity, but upon what the commodity costs which it sends in exchange, compared with the cost which it must be at to produce the commodity in question, if it did not import it'* (Mill, 1821). To put it in another way international trade should be more beneficial for smaller and less developed countries where we can expect lower demand for importing goods comparing with wealthy countries where export is very demanded (econ.com).

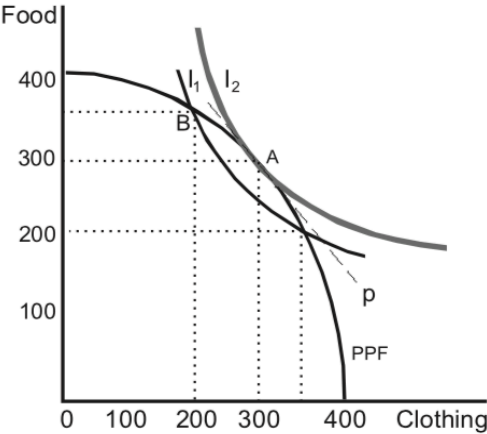
Previously illustrated approaches above were mainly focused on value theory and distribution theory. However, these theories faced its limits because the price in the market do not outlines value that people were often willing to pay for particular gadget. For this reason, a number of economists between 1870's and 1880's asserted interaction among demand and supply. Consequently, this exploration has brought very significant turnover how we view the economy today. The first economists who used neoclassical economics seems to be Thorstein Veblen. With this in mind, the fundamental approach is that buyers attempt to maximize their gains from getting goods. Besides this assumption following inferences are states as well to illustrate this: people have rational preferences, individuals maximize utility and firms maximize profits, people act as they want based on relevant information (Bertrand, 2018).

#### 3.3.1.4 Heckscher-Ohlin (HO) model

This model is named after Eli Heckscher and Bertil Ohlin who developed this model in 20<sup>th</sup> century. Since, then this model is the most popular model of international trade. According to these Swedish economists HO model demonstrates sum of neoclassical thinking and methodology. To sum up, model illustrates how nations with disparate endowments can increase its national wealth by specializing their production and exchange the goods with other countries. In addition, model also makes clear who gains and losses from international trade between countries. Besides that, it proposes what industries get tighten up and what industries boomed due to international trade. The combinations of two

good that could be produced may be represented by PPF – production possibilities frontier as it is shown on the following figure 1 (Van de Berg, 2017).

Figure 1: Production possibilities frontier (Food – Clothing)



Source: Hendrik Van Den Berg p. 55

The figure is composed of vertical Y that represents food and horizontal X that represented clothes. For instance, combination such as 200 pounds of food and 350 pieces of clothing or 300 pounds of food and 300 pieces of clothing can realistically be produced. However, there are other variants that could be produced too.

Such as 200 units of clothes and 200 units of food. If there is such a scenario the countries do not use its full resources. The PPF emphasizes the problem of scarcity. To put in another way if the country has no unemployed resources a combination on the PPF curve. So, increase of one output is linked with decrease in output in another commodity. In summary, the countries that have big labor supply should focused on goods that demanding intense labor capital.

### **3.3.2 Firm-based trade theories**

Unlike the classical theory of foreign trade, modern based incorporate other variables such as product and services product. More importantly it includes branding, customer loyalty, technology, quality and understanding of trade flows.

#### **3.3.2.1 Country similarity Theory**

The theory is associated with Swedish professor of economics Steffan Linder. In 1961, he developed the theory as he tried to explain the perception of interindustry trade. Fundamental hypothesis behind was that consumers in countries that are similar in terms of developed should have same taste of preferences. Swedish professor had suggested that corporations should produce mainly for domestic market and then seek for markets which have similar customers preferences. According to him the most prospective markets are these with related economic situation. This firm-based theory is commonly used in order to understand trade in goods where brand names and products reputations are vital criteria in buyers decision-making process (Lam, 2015).

#### **3.3.2.2 Product Life Cycle Theory**

In 1960 the theory was introduced by Professor Raymond Vernon from Harvard university. Fundamentals of this theory are originated from marketing field. According to this theory the product cycle is divided into three main phrases: 1) new product 2) maturing product and 3) standardized product. The theory suggests that production of new product will occur completely in the home country of its innovation. Mr. John Mariadoss explains the theory on following example of personal computer. The personal computer was invented as a new product in 1970's and developed into mature product during next ten years. Nowadays, computer is the standardized product and however, majority of manufacturing process is done in low-cost countries in Asia. Additionally, big corporations conduct research and development in developing countries where skilled labor and new research facilities.



As being demonstrates first two stages are usually associated with developed countries. However, developing markets such as India or China provides both skilled labor and research facilities with considerably lower labor cost advantage. (Mariadoss)

### 3.3.2.3 Global Strategic Rivalry Theory

Foundation of the theory was derived from work of Paul Krugman and Kelvin Lancaster who focused on gain from competitive advantage against other global firms. Basically, being able to compete and be successful on the market have to develop competitive advantages. Competitive advantages are referred to the barriers to entry for that industry. The barriers to entry that corporations may seek to optimize include research and development, economies of scale, the ownership of intellectual property rights or control of resource of favorable access to raw materials. (Lam, 2015)

### 3.3.2.4 Porter's National Competitive Advantage theory

Theory developed by Michael Porter deals with competitiveness in an industry is closely related to ability to innovate and upgrade. So, professor Porter explains why some countries are more competitive than others. To get complex and solid view on the theory he notes four main elements:

- Local market resources and capabilities – Porters recognized the value that resources bring such as natural resources and available labor are the key elements to identify what products and services country exports and imports. Furthermore, Porter believes that skilled labor, investments, technology and infrastructure are components that provide country sustainable advantage.
- Local suppliers and complementary industries – in other words having related industries which are able to provide inputs required by the industry could keep country remain competitive.
- Local Market demand conditions - Porter emphasized that a so sophisticated domestic market is vital to ensuring ongoing innovation which leads to competitive advantage.
- Local Firm characteristics – including firm strategy, industry structure and its rivalry. Healthy rivalry among firms will trigger innovations and competitiveness.

Moreover, Porter argued that government could increase the competitiveness of firms by its actions and policies (Mariadoss).

### **3.4 Trade policy after World War II**

After World War II the United States and its allies designed the postwar program that would generate rapid economic recovery due to recession and big unemployment caused by the war. However, this economic system was in part political system that kept fascist out of the power in the countries as Germany, Japan and elsewhere. In 1944 one of the most important agreement was made in New Hampshire in Bretton Woods resort. That's why the agreement is known as Bretton Wood Agreement (Van de Berg, 2017).

In July 1944 approximately 730 delegates from 44 countries met with fundamental goals of promoting international economic growth, creating foreign exchange system. Additionally, to the Agreement another two essential organizations were created International Monetary Fund (IMF) followed by World Bank (WB). The main goal of IMF was to monitor and analyzes if the nations across the world are in need for monetary help. On the other side World War bank was established to help out the countries that had been financially and physically demolished by World War II. Nevertheless, in 1971 Bretton Woods system collapsed because the U.S gold supply was not able to maintain number of dollars in circulation (Chen, 2020).

Up till now there is evidence to suggest that Bretton Woods agreement remains vital even in the history that helped to rebuild devastated Europe after the war. Another milestone came in 1947 when General Agreement on Tariffs and Trade was signed by 23 countries and more than 13 had signed on by 1951. Prior to nowadays GATT still is valid trade regime that specified rules such as:

- countries commit to never raising their tariffs above initial 1947 levels
- countries can offer reductions in their limits on tariffs as concessions in order to induce other countries to reduce their tariffs
- signatories give all other signatories most favored nation (MFN) status

- countries do not discriminate between foreign and domestic goods and services once they have entered their country
- countries should use tariffs rather than quotas or other, less visible, nontariff barriers whenever possible (Van de Berg, 2017).

Leading impetus for common consensus on tariffs barriers were to make sure that countries never raise tariffs and other trade barriers. There were several GATT rounds since 1934 to 1947 chiefly it was difficult and hardly imagined that 50 countries would agree on common forms of trade liberalization. Foremost, the early rounds brought some modest reductions of tariffs. As following table expresses the big changes in cutting tariffs came in about 1964 onward (Machková, 2014).

Table three outlines' changes in trade barriers through years. Slower progress in reducing trade barriers were as a result made by U.S political leaders to placed restrictions on their trade negotiators. Moreover, more countries have participated in negotiations to illustrate this by the end of the round there were about 125 countries involved in at least some sessions mainly developing countries. Despite that GATT was very relevant complex established it met its limit (McClanahan, 2012).

Table 3: Changes in tariffs barriers 1934 - 1994

	% Cut in All tariffs Level	Average Tariff as % of 1931 Level
Negotiations between 1934 and 1947		66.8
1st Round (Geneva, 1947)	21.1	52.7
2nd Round (Annecy, 1949)	1.9	51.7
3rd Round (Torquay, 1950 -1951)	3.0	50.1
4th Round (Geneva, 1955 - 1956)	3.5	48.9
Dillon Round (Geneva, 1961 - 1962)	2.4	47.7
Kennedy Round (Geneva, 1964 - 1967)	36.0	30.5
Tokyo Round (Geneva, 1974 - 1979)	29.6	21.2
Uruguay Round (Geneva, 1987 - 1994)	38.0	13.1

Source: own creation based on data from Van de Berg, 2017

Especially if countries somehow violate the behaviors and rules set by the GATT. Lack of official enforcement mechanism led to propose to be creating a new organization World Trade Organization (WTO). Uruguay Round succeeded in establishing a dispute settlement procedure since it was used more frequently than it was ever expected. After following 7 years WTO's member states push interest of launching new round of negotiations due to some unresolved issues and problems that came up after Uruguay negotiations. In 2001 Doha was chosen for this event due to its geographical so, it makes easier for protestors to travel to. Since 1974 about 40 percent of tariffs were reduced, therefore, tariffs were not the biggest challenge at Doha rounds. The completed results were estimated to be in 2005 unfortunately negotiations lasted until 2010 with little sign of revival to date.

The Doha round was based on a single undertaking that states that nothing is agreed until everything is agreed. It happens to be the first-World War II trade round that have not reached the agreement. (McClanahan, 2012)

### **3.4.1 Common foreign trade policy of EU**

Nowadays, foreign trade policy within EU plays very significant role in our everyday lives. It has been almost 80 years of negotiations and application of different rules and laws till the point as we know foreign trade EU today. It has started in 1951 in Paris where the European Coal and Steel Community treaty was signed. There is strong evidence that this treaty was fundamental for cooperation on common market after World War two. After 7 years since establishing ECSC another treaty was in Rome. Became effective in 1958 including common market beyond just steel and coal. Common commercial Policy (CCP) was very crucial due to customs union which was covered by signing Treaty of Rome. The Treaty of Rome was based on four main freedoms of goods, capital, people and services but also covered external tariffs. The Common commercial policy was very important in the 1970's when international trade evolved. Through the CPP Europe was able to be competitive in globalization world (Titievskaja, 2019).

In 1997, Amsterdam Treaty was signed following with Treaty of Nice which added provisions furthering the inclusion of commercial aspects of intellectual property rights in

the Common commercial policy. Another milestone in foreign policy came in force in 2009 when Treaty of Lisbon updated Treaties signed before. Since 2009, European Parliament has granted significant power in trade policy with opening trade agenda (Titievskaja, 2019).

On behalf of all member states EU is responsible for all external actions of trade, legislation and international agreements. However, these competences and decision-making process is in hands of member states that expressed their positions through Council sessions. CCP is a tool how to protect domestic market against external economies outside of EU. Therefore, one of the examples of CCP competences are: changes in tariff rate, the conclusion of tariff and trade agreements, the achievement of uniformity in measures of liberalization, export policy. Besides all of them there are measures to protect trade against subsidies and dumping. With these mentioned tools EU can control imported goods. This is very important for domestic market because it has been happening that external governments have subsidies its produce in order to sell on EU market. This put domestic production in danger (D'Alfonso, 2020).

### **3.5 History of automotive industry**

Comparing to other inventions the original idea of automobile cannot be associated just with single individual. Around 15<sup>th</sup> century many philanthropists came up with idea of self-propelled vehicles. This idea was derived from windmills that were necessary back in 15<sup>th</sup> century. Realization of one of the first wind carriages were in 1600 in Netherlands. After two centuries Otto von Guericke German scientist brought the idea about air engine and invented air pump that helped to build first air-powered vehicle produced in 1832. Following to German scientist another invention was introduced steam carriage that was based on suggestive modern turbine. However, the steam-powered vehicles were produced earlier the milestone for automotive industry came in 19<sup>th</sup> century. Notably between 1860 and 1870, Germany and France were the most important countries that manufactured vehicles. Not long time after Germany and France launched the production three countries have followed this trend as well. Namely Britain, Italy and United States of America that later dominated the market. Almost all firms that early produced engine vehicles were tiny

with small numbers of produced cars. However, there were many firms that wanted to be producing vehicles despite all of that just small number of them survived. The handful number of companies have survived due to its expertise from manufactures. For instance, makers of horse-drawn vehicles, bicycles or those firms were kind of involved in machinery manufactures (Robinson, 2020). Before and during World War II automotive industry suffered because significant resources were invested into military equipment and its resource. Therefore, after the war the industry suffered and there were not enough vehicles as was demanded. Based on the article from honored history website first modern motorcar was assembled because of Wilhelm Maybach for Daimler in 1901. The car had thirty horsepower engines.

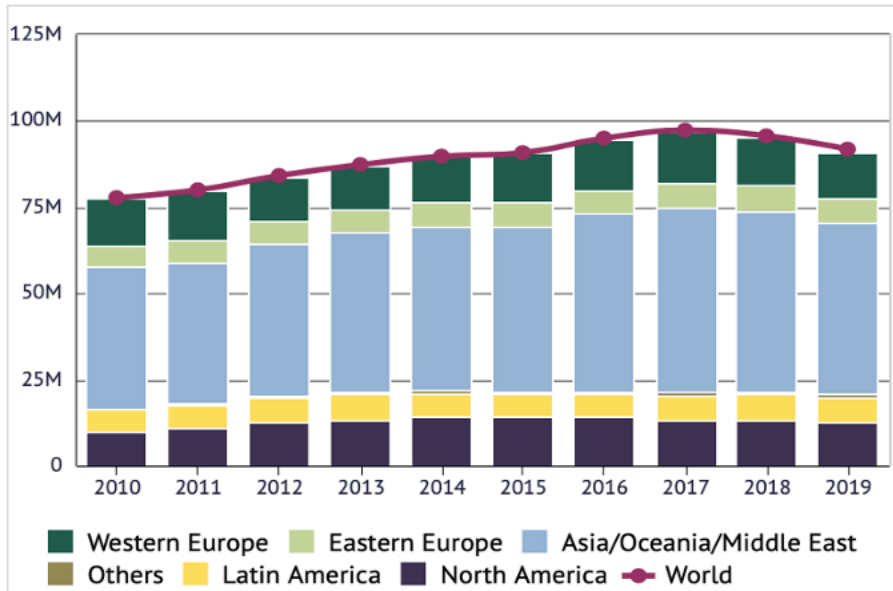
With this in mind Dailmer was the most significant and respected automotive company that hired about 1700 employees who were able to be manufactured less than a thousand cars per year (history.com, 2018). Another key thing to remember was outstanding technological advance that was the initial impulse for mass production popularized in the United States of America. Europe in 19<sup>th</sup> century experimented with standardization and mass production although mass production is closely correlated with in United States. Having high standard of living, long distances and its large population led to be legitime motherland of this innovation known as Mass production. (Robinson, 2020) Lack of trade barriers such as tariffs in the among states in United States led to big volume of sales. In addition to geographical layout there are some advantages in favor of manufacturing cars such as raw materials. Henry Ford caused the revolution with his Model T. Model T was put on the market in 1908 and more that 15 millions of them were sold. However, millions of the cars manufactured put the light on a weak part of the production. There were limitations of its company, therefore, Henry Ford was forced to come up with a solution. The method that should help to be more sufficient and more volume oriented, so he saw the solution in assembly line. This technique was first used in Michigan at Henry's Ford plan in Highland Park in 1910. That has been using by companies until today (history.com, 2018).

Since then, the Ford's strategy quickly spread across the world and was adopted by other American manufactures firms and later Europeans firms seized the technique as well. Despite this technique was mainly for big corporations that were able to invest into plans that would have capacity to create assemble line. In fact, the big plants were able to spread the costs over the large volume production, hence, the small companies were not able to keep up with having costs as low as big firms. As a result, three main large-scale organization took place on the market in the United States, and they supply the market from three-fourths. Economic depression impacted vehicle industry as well, the production declined from 5 million in 1929 just slightly over a million in 1932. (Britannica) American automobile manufactures played very critical role in following World War II, because they created military items of value estimated at USD 29 billion. On the contrary, motor vehicles in Europe were seen as a exporting product that could help restore the war damaged economies (Bertrand, 2018).

### **3.6 Automobile industry**

Automobile industry plays a critical role in the country's socio-economic development. Last decades or so the industry was booming, therefore, many countries got involved in manufacturing cars while the alignment of forces on the cars market is constantly changing (Saber, 2018). According to OICA that stands for world association of car manufactures almost 74 million cars and almost 24 million trucks were produced in the world just in 2017. Automobile trade has been playing vital role in the economy. As being estimated the average annual turnover of the world automobile commerce is related over 2.75 trillion EUR which correlates to 3.65% of the world GDP. The Following graph shows the production motor vehicles by region (knoema.com).

Figure 2: Global Motor Vehicle Production by Region



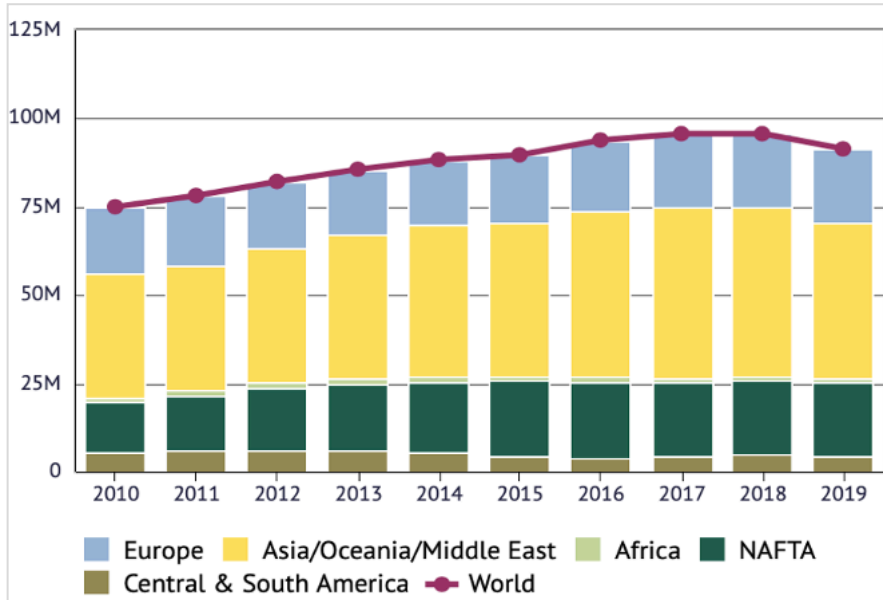
Source: Knoema

As graph shows since 2010 the volume of produced units was increasing till 2017 when approximately 97 million motor vehicles were produced. In addition to that based on Mr. Saberi analysis automobile industry increased its production by 25% between 2007 and 2017. According to Knoema analysis worldwide production of motor vehicles was estimated approximately at 92 million that included 67 million passenger cars and 25 million commercial vehicles. On the contrary, since 2017 the volume of unites produced has been decreasing due to many variables such as weak demand etc. For instance, end the end of 2019 worldwide production was estimated at 91 786 861 motor vehicles. The difference of units between peak in 2017 and 2019 was over 5 million cars less than two years before (knoema.com).



Following figure 3 outlines number of motor vehicles sold by region. The biggest portion of global sales is represented by Asia. In 2019 the volume was calculated at 44 million units. NAFTA ranks as second biggest region by sales volume.

Figure 3: Global Vehicles Sales by region – number of units



Source: Koema

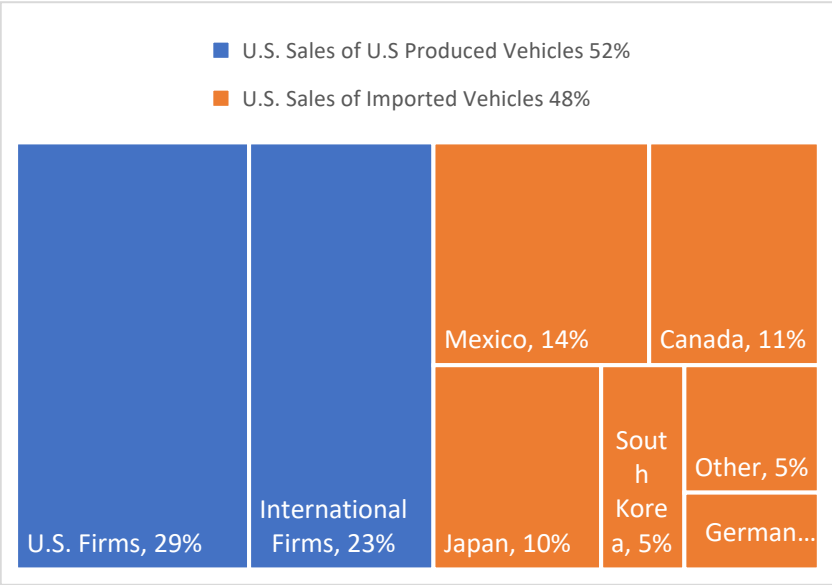
To illustrate how this industry is important for economy Bureau Institute of Economic estimated that automotive industry contributed 2.7 percent of gross domestic product in the United States in 2018. That is equivalent of 545.4 billion USD (Knoema.com).

### 3.6.1 NAFTA

On average, the industry provides about 18 million working positions. Furthermore, the retail sales of new cars, used cars and auto parts cover roughly 20 percent of total retail sales in the country. The organization Internationale des Constructeurs d'Automobiles (OICA) ranks the United states as second-largest producer of vehicles only China. manufactures more cars than USA. However, United States relies on other countries from which they import essentials parts to meet consumer demand. In last couple of years 48 percent of sold cars in the United States were imported. One of the crucial parts of

successful automotive industry in the United States is close cooperation NAFTA states among each other. Almost any car is fully made on the land of United States. Based on the National Highway Traffic Safety Administration analysis roughly 45 percent of a car consists of imported parts and components. (Bureau, 2021) The following figure 4 shows diversification of U.S market where 52 percent of sold cars are made really made in the United States on the other hand 48 percent of whole sales are imported vehicles.

Figure 4: Sourcing of U.S. Light Vehicles Sales



Source: Own elaboration based on data from CarGroup analysis 2018

Imported vehicles that are sold in the United States mainly come from Mexico 14%, Canada 11%, Japan 10% followed by South Korea and Germany that counts just for 3% of U.S market this percentage proportion is for 2017.

As being described in the article about U.S consumer and economic impacts there is still significant importance where does the car assemble. Even if it is assembled in Mexico or Canada, it has still impact on employment in the U.S. Based on their estimations if the car is produced in the Mexico the final products consist somewhere between 20 to 30 percent of U.S content. On the contrary, non-NAFTA states that import cars into U.S. usually have just 3.5 percent of content from U.S. (CarGroup 2018).

### **3.6.2 ASIA**

Since the economic reform in China in 1978 automobile industry went through many phases of growth, but never China production power was not strong as we know it today. Back in that time manufacture firms had low productivity that led just to five thousand assembled cars in 1980. Low supply in China and growing income among population logically led to import. However, China's policy in that period of the time was very defensive and protective. In order to protect domestic automobile industry tariffs were set at 250 percent (Li, Xiao and Liu, 2015).

From the beginning after China joined WTO in 2001 there were no significant signs how opening the economy will help. Quickly after fulfilling WTO conditions and reducing tariffs China experienced rapid development by virtue of three fundamental components of trade: export, infrastructure and investments. Globalization caused that China's GDP quadrupled within 10 years after joining WTO community. Clearly automobile industry also experienced turning point where increase of production raised tenfold. Hence, China surpassed US in 2010 to become most significant car producer in the world (PwC, 2020).

In 2019 total car production in the China was almost 26 million motor vehicles from 83 percent went toward manufacturing personal cars and just 4.3 million vehicles were designated for commercial use. The annual gross product of the China's automobile industry has exceeded 5 percent of annual GDP every year since 2002 (investopedia.com).

### **3.6.3 EUROPE**

Approximately just about 35 years ago we can talk about coherent European-level coherent automobile policy. European policy makers called for close cooperation as a reaction to the oil crisis in 1981. Automobile industry in Europe had to cooperate in order to still be competitive on the market due to increasing and becoming powerful Asian and USA automobile manufactures. Therefore, in 1988 European Commission published a memorandum that set the policy structure that would support automotive industry. Besides,

the framework of the policy one of the most vital institution for car industry designated and it was Association des Constructeurs Européennes d'Automobile known as ACEA. Until this day, ACEA represents car manufactures across the Europe and additionally American manufactures operating in Europe (Bernard, 2018).

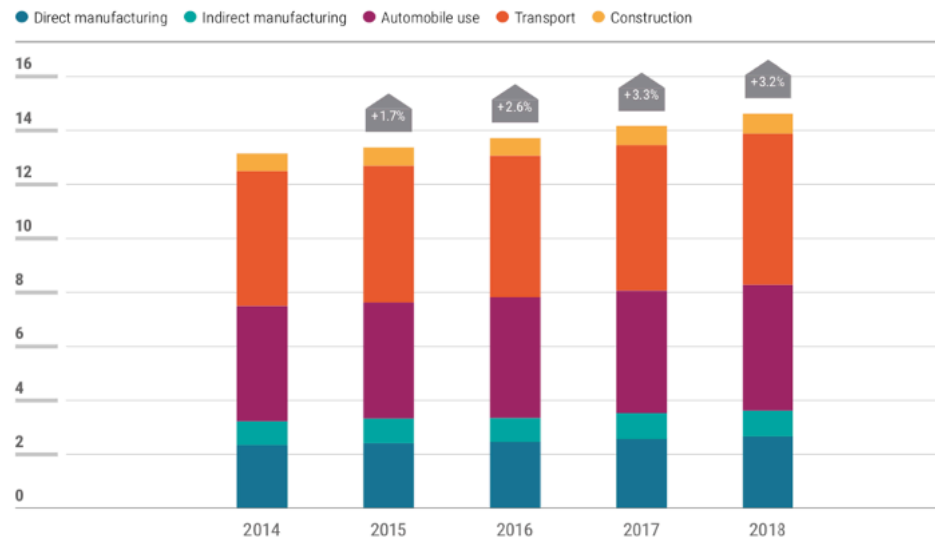
According to European Commission report Bulletin from 1996 proves that there were concerns about automobile future in Europe. A report explains that '*However, although the European automobile industry has made great strides in productivity and quality and has been successful on the main international markets, it cannot be regarded as a growth sector as far as employment is concerned. On the contrary, new production concepts and the trend to low-cost locations outside the European Union will lead to further losses in Member states*' (Bulletin, 2016). Hence, the Commission suggested a few effective steps that should be taken in order to create a favorable business environment. EU suggested following measures:

- Promoting intangible investment. Commission believed that research programmers are considered as a part of automobile industry, therefore, vocational training programmers and Structural Fund initiatives can also benefit industry workforce.
- Developing industrial cooperation, namely in closely correlated industries
- Ensuring fair competition within European borders and towards third countries as well. In addition to that, commission is encouraging to introduce international harmonization of technical regulations
- Introducing relevant regulatory framework that helps the industry in areas such as taxation, safety and reduction of emissions. (Bulletin, 2016)

European Commission considers automobile industry as one of the critical for economical and intellectual stability in the region. Based on the EU official data from 2020 a car industry provides 14.6 million jobs both directly and indirectly, so it is a key employer within EU borders. Keeping this in mind it is equivalent 6.7 % of total employment in EU. Therefore, the industry closely impacts macroeconomic and microeconomics factors at states level, but more importantly at level of the EU market. It has links to many other industrial sectors. Such as steel, chemicals, textiles, ICT and as

mobility services as well. Thus, the industry has multiplier effect in the economy, and it is considered as one of the backbones of the economy. The following graph shows the trend in automotive employment in 2014 and 2018 period. Figure 5 captures direct and indirect jobs in EU, represented in millions of jobs. (ACEA, 2020)

Figure 5: Employment in the EU automotive sector



Source: ACEA pocket guide, 2020 - 2021

As we can observe from the figure on the page 37 from 2014 there is up slopping trend in employment across the industry. However, manufacturing direct workplaces are being pretty steady through 2014 to 2018. End the end of 2018 increase by 300.000 jobs comparing with year 2014. The biggest portion of the employment is represented by transportation that was estimated about 5.6 million jobs in 2018. If we compare 2017 and 2018 the most significant percentual increases of jobs by sectors were in transport 3.7%, direct manufacturing followed by construction with 3.1% increase in jobs. Overall, in 2018 about 446 864 new jobs were created that represents 3.2 % increase comparing with year 2017 (ACEA pocket guide, 2020 - 2021).

### 3.6.3.1 Impact of automobile industry on EU

The automotive industry is a major industrial and economic force in the European Union. Already being explained how many jobs are dependent on the industry. Because of this turnover generated by the sector represents roughly over 7 percent of the European Union GDP. Moreover, the industry is very significant for tax contributions related to the industry. Based on the research conducted by McKinsey company tax income was 410 billion EUR (McKINSEY, 2019).

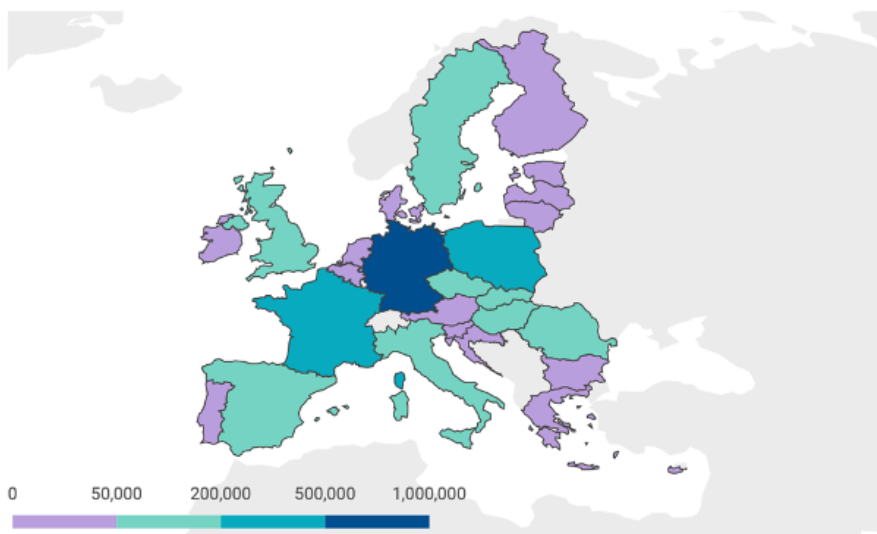
Motor vehicle production in EU in 2019 was calculated at 18 507 834 vehicles considering passenger cars, medium commercial vehicles, heavy commercial vehicles and light commercial vehicles. This almost 19 million vehicles cover just 19% percent of world commercial production that is led by Asia continent. However, this 19% has very significant impact on EU economy. It is estimated that those motor vehicles were manufactured by 229 automobile assembly and production plants across the whole European Union.

According to ASEA in 2018 almost 6.1 million vehicles were exported with trade value of 138.347 million EUR. On the other hand, approximately 4.2 vehicles were imported to the EU territory with estimated in value at 54.077 million EUR. Therefore, generating a trade surplus of 84.4 billion EUR for the European Union in 2018. However, although in 2019 the significant decrease of volume exported by -6.8 percent. In other words, number of exported vehicles was 5.6 million in value of 135.937 million EUR. Significant less deviation captured with imported vehicles -0.9%.

To put it another way the trade balance in 2019 was 73.900 million EUR. Percentual change 2019 and 2018 in trade in volume was. A study conducted by ASEA demonstrates that the industry generates an annual trade surplus of 74 billion EUR for the European Union (ACEA pocket guide, 2020- 2021).

Ensuing a picture 1 illustrates countries and its automotive employment across the EU. Darker the color, higher number of jobs. Based on the data from 2018 just four counties have higher number auto manufacturing jobs in comparison to Czech Republic.

Picture 1: Direct automotive manufacturing jobs in the EU, by country in 2018



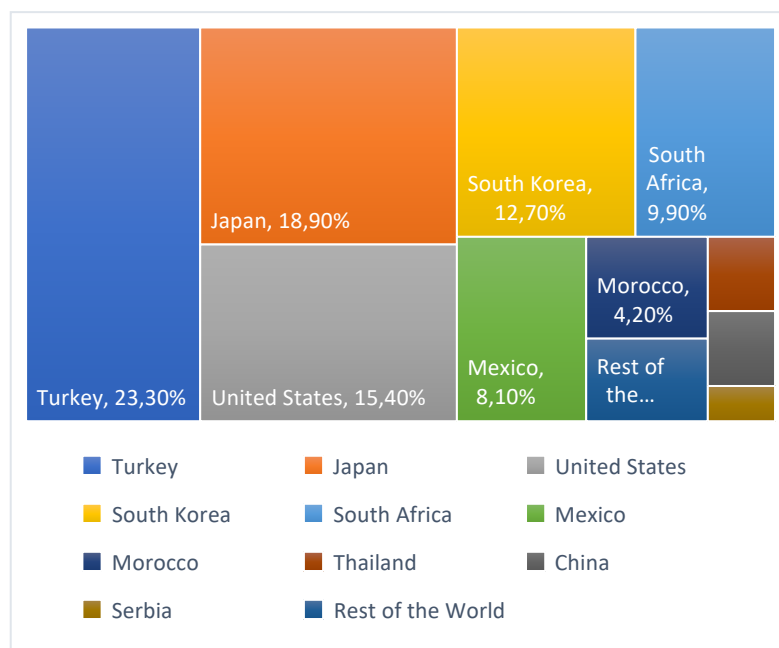
Source: ACEA, 2020

Foremost Germany that has about 880 000 jobs, followed by France 229 422, Poland 213 708, Romania 190 848 and the Czech Republic that rank at fifth place in Europe (ACEA, 2020). The map is emphasizing how vital is the industry in terms of employment for the central Europe.

### 3.6.3.2 EU vehicles import

As being explained EU imports approximately about 4 million vehicles yearly. The biggest proportion is devoted to passengers' cars. As being shown on the figure 6 countries that import the most volume of the cars to the EU.

Figure 6: Countries of origin of EU motor vehicle imports – value market share in 2019



Source: ACEA, pocket guide 2020 -2021

The most significant countries that import to the EU are Turkey, Japan, and United States. The EU imported 62 billion EUR worth vehicles in 2019. For instance, Turkey imported volume worth of 14 463 million EUR that represented about million vehicles in 2019. As well as EU paid about 11 717 million for cars from Japan. The EU imported 3.6 million cars in 2019 (ACEA, 2020).

### 3.6.3.3 Vehicles export by EU

Principally export is very critical feature for automobile industry and for the balance of trade each economy. The following table four illustrates the trend of exported vehicles in units. The peak was hit in 2016 where overall number of exported cars overtook 6 254 941 units.

Secretary General of ACEA Mr. Erik Jonnaert states: *‘New data shows that there are some 308 million motor vehicles in circulation on the EU’s roads at the moment, of which 268 million are cars. Taxation on these vehicles is worth €428 billion per year in the*



*EU15 countries alone – that is more than two and a half times the total EU budget.’ (ACEA, 2019).*

Table 4: Main destinations for EU motor vehicle exports – in units in 2019

	2014	2015	2016	2017	2018	2019	% change 19/18	% share 2019
<b>WORLD</b>	<b>6,063,651</b>	<b>6,084,750</b>	<b>6,254,941</b>	<b>5,983,463</b>	<b>6,023,116</b>	<b>5,610,731</b>	<b>-6.8</b>	<b>100.0</b>
United States	1,010,196	1,271,612	1,200,995	1,190,782	1,171,383	1,053,909	-10.0	18.8
China	613,632	472,698	534,994	580,557	560,916	469,510	-16.3	8.4
Switzerland	301,777	331,908	315,251	303,723	293,217	321,289	9.6	5.7
Japan	237,991	250,839	279,778	282,625	286,451	264,837	-7.5	4.7
Turkey	418,346	592,114	585,255	525,417	315,044	240,200	-23.8	4.3
Ukraine	78,710	44,976	73,924	113,808	110,523	181,510	64.2	3.2
Norway	171,125	176,945	181,191	178,030	228,096	179,908	-21.1	3.2
South Korea	177,603	230,811	182,736	190,653	197,172	175,632	-10.9	3.1
Russia	328,960	191,707	145,352	160,838	185,130	171,857	-7.2	3.1
Australia	183,084	227,920	206,820	210,304	200,267	162,154	-19.0	2.9

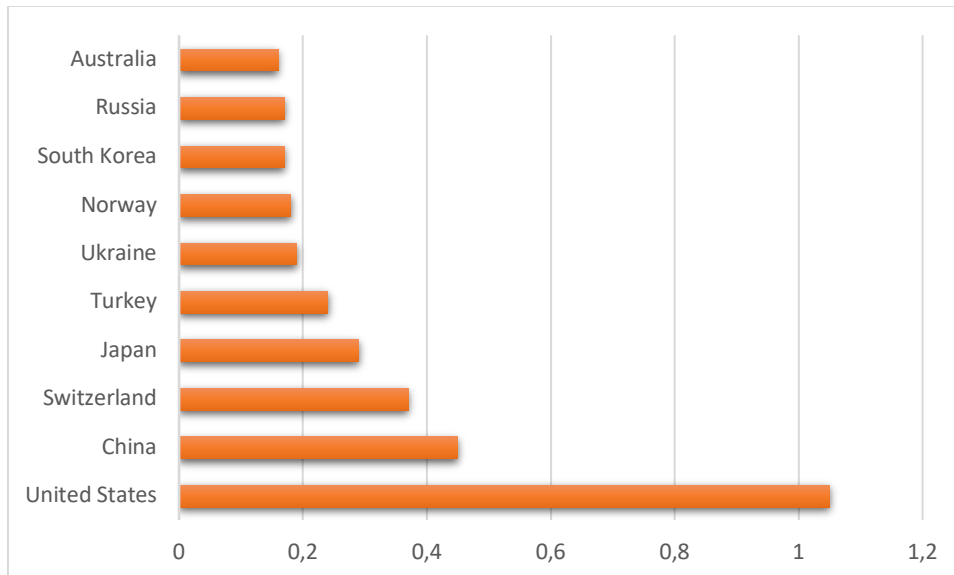
Source: ACEA, pocket guide 2020 - 2021

Since, then the trend has been up and down. End the end of 2019 the total volume of units exported was estimated at 5 610 731 that is decrease by -6.8 percent comparing with 2018. The main countries that bought less cars from European Union were Turkey almost -24 percent followed by China that changed number of units by – 16.3 percent. Overall value in 2019 was 135 937 million EUR. Clearly United States spend the most money accounted at 38 million EUR, secondly China spends over 22 million EUR for vehicles from EU.

A study conducted by AISA reports that EU vehicle exports brought in EUR 136 million in 2019 (ACEA, 2020). Even tough export has very meaningful contribution into EU trade. Despite generating jobs and economic growth this industry brings another relevant source of income for the government.

Mainly the countries that buying the cars from Member states are United States, China, Switzerland and Japan. As showing the following figure 7, 18.8% of EU vehicle exports go to the United States and 16.5% go to China.

Figure 7: Main destinations for EU motor vehicle exports – in million units 2019



**Source:** Owen elaboration based on data from ACEA pocket guide 2020 - 2021

U.S and China account for nearly of 43% of the value market share exported cars from the EU. In other words, these two countries play noteworthy markets for EU firms. Therefore, any trade barriers implemented by these countries could potentially harm the industry; therefore, stability in some member states such as the Czech Republic (ACEA, 2020).

## **4 Practical Part**

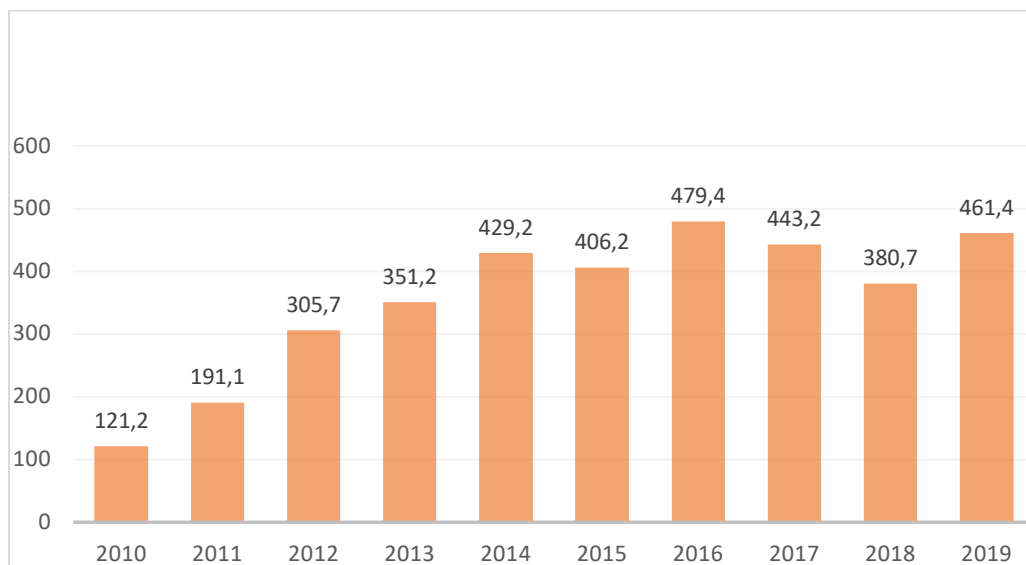
### **4.1 The Czech Republic foreign trade**

In a global economy, no nation is self-sufficient. Therefore, foreign trade plays a vital role in today's modern world. Each nation worldwide is less or more involved in trade to sell what it produces and acquire what it lacks. Due to its history over the last 600 years, we can report the first sights of silk roads among the regions. Basically, without international trade, few nations could maintain just a limited standard of living. Hence, the country would be able to use just the resources found within the country. This would lead to a defined number of products (Rodrigue).

The Czech Republic is situated in the Central Europe region that was for centuries an object of great powers competition. In recent years, the Czech Republic is enjoying the warmest ever relationships with its neighbors. The Czech Republic has an open economy and ranks in the top 40 wealthiest countries thanks to international trade. The country export to gross domestic product ratio accounts for approximately about 80 percent, with the build of export headed for the European Union. Additionally, external demand for Czech products and services has a relevant impact on the Czech economy (Ministry of Foreign Affairs of the Czech Republic.cz).

The trade balance is one of the most used indicators of countries' performance. A country's trade balance is positive means export exceeds the value of imports. A positive trade balance indicates a trade surplus, while a negative trade balance indicates a trade deficit. The Czech Republic had a negative balance just right after separation from Slovakia. Since then the country has been very effective in terms of having a positive balance. As we can see on the following page 44.

Figure 8: Balance of trade in the Czech Republic 2010 – 2019, in billion CZK

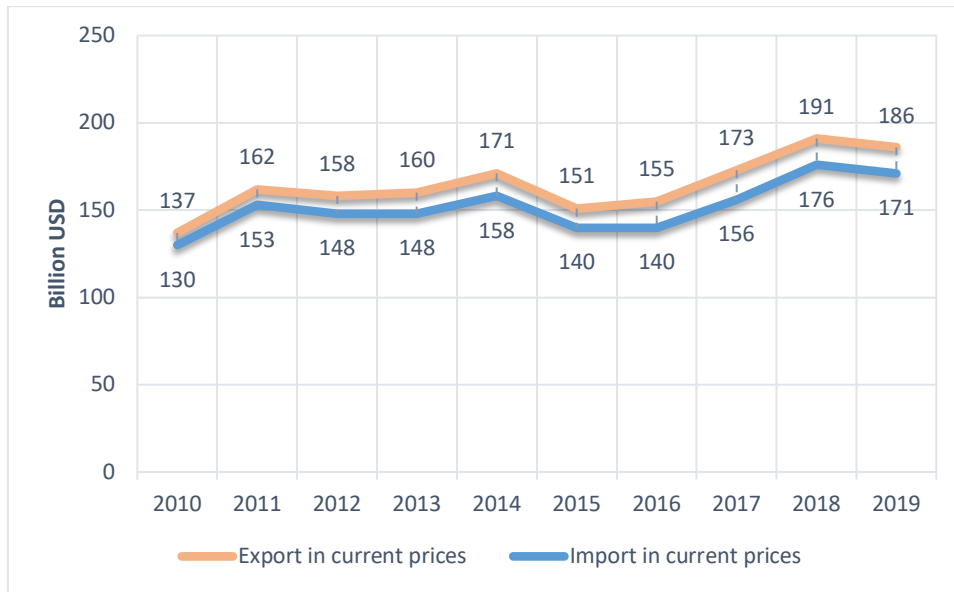


Source: Own elaboration based on CZSO

Figure 8 captures peaks and lows of the trade in the Czech Republic. We can see up slopping trend since 2010 to 2015, when balance shrink by 5.4 percent to 406, 2 billion CZK. Instead in 2016 the balance hit its peak ever at 478,4 billion CZK, increased by 18 percent. Consequently, between 2017 to 2018 balance had been declining; however, in 2019 increased by 21.2 percent to 461.4 billion CZK. In 2019 Czech foreign trade have accounted the highest record of 479,4 billion of CZK represented by 3.6 percent comparing with 2018. Overall trade balance was estimated at 501.3 billion CZK this was the best result ever in terms of trade balance in the history of the Czech Republic. (OEC) The most vital importer of Czech goods is traditionally Germany that accounts for 39 percent of Czech export. Despite Germany was at the level of technical recession the overall import increased by 1.6 % in 2019 (export.cz, 2020).

The most significant articles of Czech export remain machinery and automotive equipment. Therefore, Czech Republic is still very dependent on exporting goods across its borders. The Czech Republic export to third countries recognized increase by 10% especially United States of America are meaningful trade partner. Overall value of exporting articles was 106.4 billion CZK in 2019 comparing with value of 90.9 billion CZK in 2018. Despite the trade barriers implemented by U.S towards EU countries. Following trade partners out of EU borders accounted an increasing trend of import Russia, Japan and Ukraine. On the contrary opposite trend was observed in India where we exported 3.2 % less articles comparing with 2018 (moderni ekonomicka diplomacie MZV).

Figure 9: Total value of import and export of Czech Republic, 2010 - 2019, billion USD



Source: Own elaboration based on Knoema data

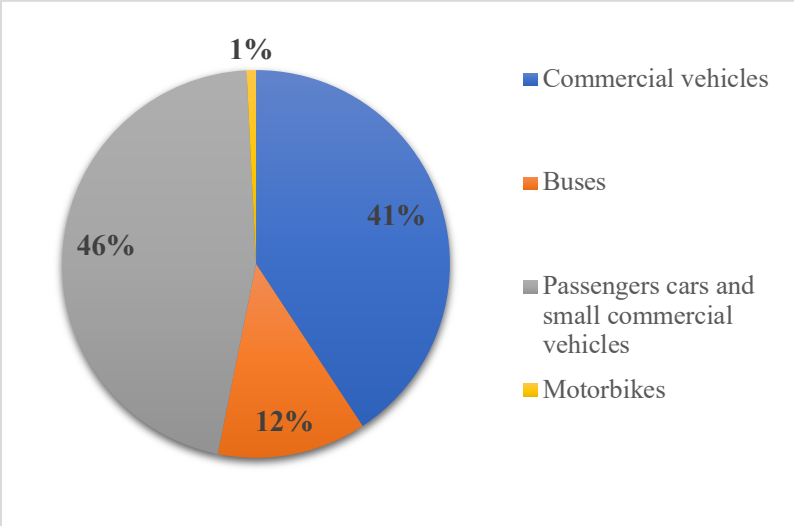
As well as Czech Republic is dependent on import in 2019 the country imported 178 billion USD making it the number 29 trade destination across the planet. According to data OEC in last 5 years the country imported value has changed by 23.5 billion USD from 151 billion USD in 2014 to 174 billion USD in 2019. The most imported articles are led by Broadcasting equipment, vehicles parts, office machine parts, computers etc. In terms of import Germany is our biggest supplier accounting for 27.2 % of the market followed by China with 11.7 %, Poland 8.83 % and Slovakia with 5.43 % (Pyzsko, 2018).

## 4.2 History of automotive industry in the Czech Republic

Manufacturing cars has very deep tradition in the Czech Republic. Already in 1898 first vehicle called President was assembled in Koprivnice. Another car company had been active on the market such as Larurin&Klement, Walter, Praga or Nessedldorfer Wagenbaufabrik later known under name Tatra (skoda.cz). After 1946 auto manufacturing industry were leaning towards big manufacturing plants owned by the state. However, the most important challenge came after 1989 when mostly in post-communist countries most of the companies became privatized. Principally all big firms owned by state were given into private hands. In this period most of the market was dominated by small, manufactured passengers' cars and small commercial vehicles. However, almost 97 percent of this type of vehicles were made by

Skoda establishment. As the Graph expressed another 40 percent of the market were designated for bikes primally made by company JAWA from Tynec nad Sazavou that accounting for 60 percent of bike production (Czech Invest).

Figure 10: Number of produced cars in Czech-Slovakia in 1989



Source: Own collaboration based on AIA data

In 1989, commercial production was estimated at 50 940 vehicles that represented 12 percent of the market. Commercial vehicles production was dominated by three domestic companies Liaz, Avia and very known Tatra. The most important phase of the privatization came in 1990 when the main goal was to change the owner from public into private hands.

There was no exception in automobile industry. For example, in 1990 Skoda had very serious existential problems caused by state management. Therefore, there was strong will for finding multination investor with enough capital and knowledge which would lead out of the critical problems of the company. Based on the analysis of Michal Pícl approximately 24 interested entities wanted to buy Skoda. In 1991, the beginning of cooperation with German establishment Volkswagen had 30 percent interest in Skoda. After three years Volkswagen had 60 percent of ownership after another year ownership was raised by another 10 percent and since 2002 Volkswagen is an absolute owner with 100 percent of ownership in the company.

On the other hand, privatization did not go that smooth such in Skoda Auto case. In order to fulfill the promises made by Volkswagen Group it was necessary to restructure the

whole chain of the industry including suppliers. Having new foreign technologies on the Czech market Group designed about 94 joint ventures between domestic and foreign suppliers. Joint ventures had very vital impact on investments not just into vehicle industry, but into domestic economy. All foreign investments had changed the structure of the ownership in the industry (Czech Invest). To illustrate this, in 1993 foreign ownership in the Czech economy was 8 percent of whole GDP. On contrary, in 2016 it was more than 60 percent. Thanks to the new legislation and institutional changes Czech Republic has become the country where automobile organizations wanted to invest. For example, in 2003 investor Toyota, Peugeot and Citroen Automobile entered domestic economy and established manufacturing plant in Kolin. Czech government supported TPCA with 3.5 billion CZK for investing setting the plant in the Czech Republic. On behalf of provided support by a state the Czech Republic is one of the countries where foreign investors what to establish their plants. (Pícl, 2019)

### **4.3 Impact of automotive industry on the Czech economy**

The manufacturing of motor vehicles is one of the most vital industries for the Czech Republic. In other words, the automotive industry is one of the pillars of the Czech economy and prosperity. Despite that Czech Republic is a relatively small country comparing to big, manufactured giants as Germany, China, United States, etc. The Czech Republic plays a noteworthy role in manufacturing motor vehicles, primarily passenger cars. The industry is vital in terms of economy and workforce. The manufacturing industry is one of the main employers in the Czech Republic. Based on the analysis made by Michal Pícl in 2016 volume of assembled cars were 1.35 million cars that brought the Czech Republic fifth position in Europe. In central and east Europe is the Czech Republic number one in passenger cars (Pícl, 2019).

Based on the Automobile industry president, Mr. Bohdan Wojnar in the Czech Republic, production in 2017 was estimated at 1.4 million vehicles, so it was more by 70 000 vehicles compared with 2016. That represents 5.2 percentual increase. In Mr. Wojnar's view, the year 2017 was successful for the Czech automobile industry due to world and domestic demand for cars. Furthermore, similarly to automobile sector growth, the demand stayed strong across our borders. This trend led caused the production grew faster than the Czech economy, so the industry had a very significant positive impact on the domestic economy (mpo.cz, 2017).

### 4.3.1 Balance of trade

The following table 5 on page 49 outlines differences in import and export of passenger's vehicles within 2010 – 2019 period. In whole examined period export outnumbered import multiplentimes. Since 2012 to 2014, export was six-fold times bigger than import. For instance, in 2015 import increased by 31 percent in comparison with 2014. However, import has been increasing as well, therefore, there is no such a rapid difference in terms of balance of trade. (mpo.cz, 2017)

Table 5: Foreign trade with passenger's cars, 2010 – 2019, values are in billion CZK

Years	Import	Export	Trade Balance
2010	45 978	238 303	192 325
2011	47 886	273 856	225 970
2012	46 213	295 665	249 452
2013	47 453	298 667	251 214
2014	61 131	367 087	305 956
2015	80 478	417 922	337 444
2016	94 129	456 397	362 268
2017	103 888	497 253	393 365
2018	92 146	492 468	400 321
2019	96 637	513 077	416 440

Source: Own elaboration based on CZSO

### 4.3.2 The Czech Republic export of vehicles

Additionally, the Czech Republic exported passengers' cars with a value of 513 billion CZK. In view of the Czech Republic, Germany is still the key market in terms of export. For instance, Germany imported vehicles with a value of 127 billion CZK in 2019, which was approximately 25 percent of the total export. Another very significant market for the Czech auto-industry is Spain, which imported cars at 49 billion CZK, accounting for almost 10 percent of the whole export. United Kingdom was the third biggest importer of Czech cars representing almost 8 percent of the market with an estimated 40 billion CZK. France accounted for 6.8 percent, similarly Poland with 6 percent with a value of almost 41 billion CZK.

Table 6: geographical structure of vehicle export – the Czech Republic



Country	Export in billion CZK	Proportion of export in %
Germany	127 728	24,89%
Spain	49 857	9,72%
United Kingdom	40 517	7,90%
France	35 252	6,87%
Poland	30 988	6,04%
Italy	20 798	4,05%
Slovakia	18 630	3,63%
Switzerland	15 915	3,10%
Austria	15 511	3,02%
Belgium	15 357	2,99%
Netherlands	13 134	2,56%
Hungary	12 836	2,50%
Israel	12 168	2,37%
Sweden	9 658	1,88%
Turkey	9 454	1,84%

Source: Own elaboration based on CZSO

### 4.3.3 The Czech Republic import of vehicles

In terms of import again Germany plays a very meaningful role. It has been the number one car provider for the Czech Republic, the accounting value of 26 billion CZK. Porsche, BMW, Mercedes-Benz, Audi, Opel, and Volkswagen are the most common car brands imported to the Czech Republic from Germany. Seat, Nissan, Renault and Audi are the most common brand cars imported from Spain that accounts for 10 percent of the whole import in the Czech Republic (aia.com).

Table 7: Geographical structure of vehicle import – the Czech Republic

Country	Import in billion CZK	Proportion of import in %
Germany	26 008	26,91%
Spain	9 786	10,13%
Japan	8 790	9,10%
France	7 510	7,77%
Slvovakia	4 897	5,07%
Russia	4 794	4,96%
U.S.	4 591	4,75%
Belgium	2 888	2,99%
Hungary	2 654	2,75%
United Kingdom	2 635	2,73%
Turkey	2 563	2,65%
Sweden	2 559	2,65%
Italy	2 407	2,49%
South Korea	2 306	2,39%
Romania	2 029	2,10%

Source: Own elaboration based on CZSO

The imported value of cars in 2019 was estimated at 9.7 billion CZK. Japan is the third most common provider of cars for the Czech Republic, accounting for 9 percent of the import market with a value of 8.8 billion CZK, namely because their car brands Mazda, Toyota, and Mitsubishi are very popular among customers in the Czech Republic. Other countries that import to the Czech Republic are Slovakia, Russia, and U.S (czso.cz).

Balance of trade within countries we can see from the following table 8. The most significant positive trade balance the Czech Republic had with Germany and Spain. Just with these two countries, the Czech Republic is a surplus of 141 billion CZK in 2019.

Table 8: Trade of balance with vehicles, the Czech Republic in 2019

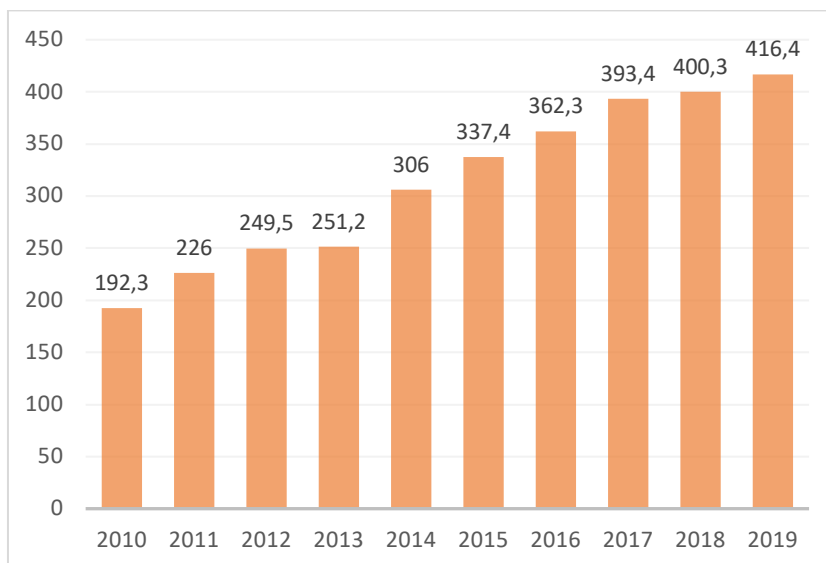
Country	Trade of balance billion CZK
Germany	101 720
Spain	40 071
United Kingdom	37 882
Poland	29 738
France	27 742
Italy	18 391
Switzerland	15 903
Austria	14 098
Slovakia	13 733
Netherlands	12 556
Belgium	12 469
Israel	12 167
Hungary	10 182
Denmark	7 217
Sweden	7 099
Turkey	6 891

Source: Own elaboration based on CZSO

Third place went to United Kingdom with 37 billion CZK in favor of the Czech Republic. Other vital trade partners in terms of positive balance are Poland, France, Italy and other ten countries.

On the contrary, in 2019, the Czech Republic had a negative balance with many countries. We had the most significant negative balance with Japan. We exported a value of 12 million CZK and imported cars of 8.8 billion CZK representing an 8.7 billion CZK negative balance. Another significant negative balance was with U.S. – 4.5 billion CZK, Russia -4. Billion CZK and South Korea – 2.3 billion CZK (aia.com)

Figure 11: Balance of trade with passengers' vehicles 2010 - 2019



**Source:** Own elaboration based on CZSO

The figure above outlines the balance of trade within the automobile industry from 2010 to 2019. Since 2010 the balance has been growing steadily. The smallest growth was recorded in 2013. Let's compare this trade of balance of automotive industry with the overall economy. We cannot see unexpected drops in the balance. The growth is steady, and the peak was recorded in 2019 when the balance was plus 416.4 billion CZK.

#### 4.3.4 Automotive Industry Association

AIA is a group of manufacturing, commercial and other companies that make up the Czech automobile industry allied industries. In 1989, exactly 17 companies have decided to set up the association. After 30 years the association has more than 145 members in the Czech Republic, moreover, the Slovak AIA is the member of the association in the Czech Republic. The main objectives of the union are:

- To develop the Czech automotive industry as a specific branch of the national economy
- To present the automotive industry as an integrated sector

- To promote the interests of the automotive industry in the Czech Republic and abroad in all appropriate places and at all levels
- To develop collaboration amongst its members and observers in technical, production and commercial fields
- To promote cooperation between the automotive industry in the Czech Republic and foreign partners

Automotive Industry Association (AIA) cooperates with institutions that have close relationship to the motor industry. AIA is only national association in this sector, and it is member of international organizations such as Association des Constructeurs Européens d'Automobiles, Association des Constructeurs Européens de Motocycles and Organization for data Exchange by tele Transmission in Europe and European Automobile Manufacturers Association. (AIA.cz)

Production of firms associated with AIA are responsible for 23 % of industrial production in the Czech Republic. This production represents approximately 21 % of whole country export which leads to 9 % of GDP created by companies in AIA association.

#### **4.3.5 Skoda Auto company**

Two young gentleman's Vaclav Laurin and Vaclav Klement started manufacturing bicycles that were called Slavia. Nevertheless, in 1905 Vaclav Klement and Vaclav Laurin started manufacturing automobiles in a small plant in Mlada Boleslav. A firm quickly had about 350 employees; after having two successful years, the company started hiring more people. In 1907 company had about 600 employees already. Yearly in 1910, Laurin and Klement's company was the most prominent automotive company in central Europe. The companies' cars were used across the world, such as in Japan, Australia, or New Zealand. However, World War I had slowed the company's technological process because owners decided to cooperate with Skoda plants in Pilsner. This led to the forfeiture of the brand L&K that was replaced by Skoda's name. The first car with the Skoda logo was assembled in 1926 for former president Tomas Garrigue Masaryk (idnes.cz, 2020).

The Velvet Revolution in 1989 brought the idea of bringing the strong partner that has capital and know-how. Therefore, they started to cooperate with already strong partner Volkswagen Group that already had enough finance and know-how needed for Vaclav Klement and Vaclav Laurin (Czech invest.cz).

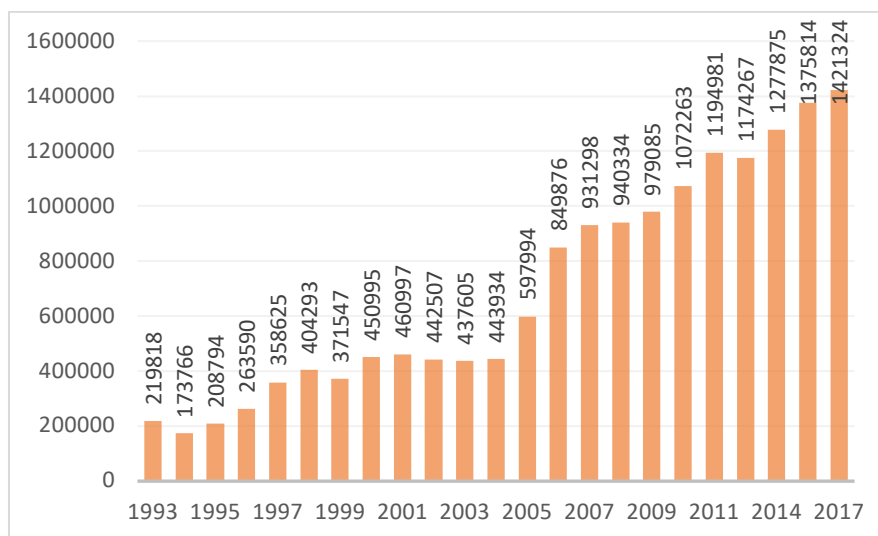
The firm's situation has always been unmistakable because it has been part of the Volkswagen Group for almost 30 years. Thanks to globalization and Volkswagen Group, Skoda is operating and delivering vehicles to customers over the one hundred markets globally and offers its customers a total of nine model lines. As being emphasized, automobile trade is a vital pillar of the Czech Economy.

This is mainly because Skoda Auto has an economic and sociological impact on the economy. It is accounting for over 34 800 jobs in the country. The headquarters is in Mlada Boleslav. The company has two more factories in the Czech Republic located in Vrchlabi and Kvasinky. Despite the manufactories in the Czech Republic, cars are also assembled globally, namely in China, Russia, Slovakia, Germany, Algeria, and India. From 1905 when the company was established, Skoda Auto celebrated a milestone of 22 million manufactured cars to end the end of 2019 (Deloitte, 2019).

#### **4.3.6 Production of vehicles in the Czech Republic**

According to Michal Pícl and his research automobile industry represents 22 percent of Czech export. The Czech Republic is among the leaders in terms of the generation of vehicles per 1000 habitats. The following graph captures the production of small passenger's and small commercial vehicles produced in the Czech Republic in the period from 1993 until 2017.

Figure 12: Production of passengers and small commercial vehicles in the Czech Republic 1993-2017



Source: Own elaboration based on AIA data

As we can see from Figure 12 above in the last 24 years, the Czech Republic production has risen by more than 540 percent. However, economic crises did not impact the automobile industry significantly how can be seen from the graph. Just a small decreased in volume can be examined in 2002. The crises had a more compelling impact on employment than on production, as figure 12 expresses. Crises affected every country in the world. Some were impacted more than others. However, there were different approaches how to deal with the crisis. For example, in the Czech Republic, the automobile manufacturers started laying off many people compared with Germany, where the government tackles the problem with Kurzarbeit's implementation. So, German vehicle firms were able to keep unemployment low comparing with establishments in the Czech Republic.

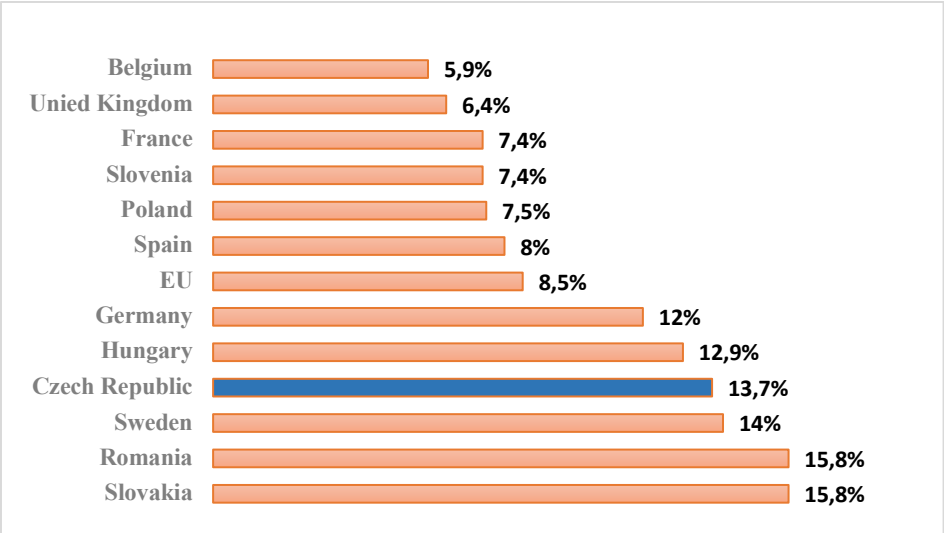
Due to increasing foreign investments, small cars' increasing production of commercial vehicles consequently after 1989 sharply decreased. As economists Michal Pícl emphasized in 1990, commercial vehicles' production was estimated at 47 thousand vehicles, and after 5 years, production of the same type of vehicles decreased at 5.4 thousand of pieces. Lastly, in 2009 just 1 000 000 vehicles produced. The main reason behind decreasing number of produced commercial vehicles is, according to Mr. Pícl no successful privatizations. In the same period, the Czech Republic was very well oriented on bus manufacturing as well (Pícl 2019). However, the decrease in production was caused by low demand on the domestic

market. In '90s just one thousand buses were sold on the market. Notwithstanding, the trend is likely to be changing back to three thousand manufactured busses (aia.com).

### 4.4 Employment

An automobile is the backbone of the Czech economy. To be clear, not just the Czech, but in another country producing a considerable volume of cars, this sector is indispensable for the economy. According to Ministry of Competition estimates, in 2017, the sector directly employed 160 000 people across the Czech Republic as the figure below outlines the share of direct automotive employment in total manufacturing.

Figure 13: Share of direct automotive employment in total manufacturing



Source: ACEA, 2020

Also, approximately 400 000 jobs are indirectly correlated with the automobile trade in the Czech Republic. Almost majority of the countries in Europe are somehow included in the manufacturing process of cars. In 2018, the Czech Republic covered 13.7 percent of the share of direct automotive employment in total manufacturing for each of the 27 member states of the European Union and the United Kingdom. Just three countries had a higher percentage of share than the Czech Republic. Slovakia and Romania had 15.8 % percent of share followed by Sweden with 14 percent then Czech Republic followed by Hungary with 12.9 percent and surprisingly Germany had just 11.8% of share. The average of the EU 27 was 8.5 percent. Data just emphasizes how important is the industry for Czech employment (ACEA).



However, most of the employees are not directly employed but indirectly how we can see on the Czech Republic's consequent map. Mainly industries that profit from auto manufacturing are textile, steel, and IT, representing many more job opportunities.

The following map expresses the companies' geographical spread in manufacturing and other phases of the process. The following map illustrates firms across the Czech Republic that are involved in the automotive industry.

Picture 2: Geographical layout of firms involved in automotive industry in the Czech Republic

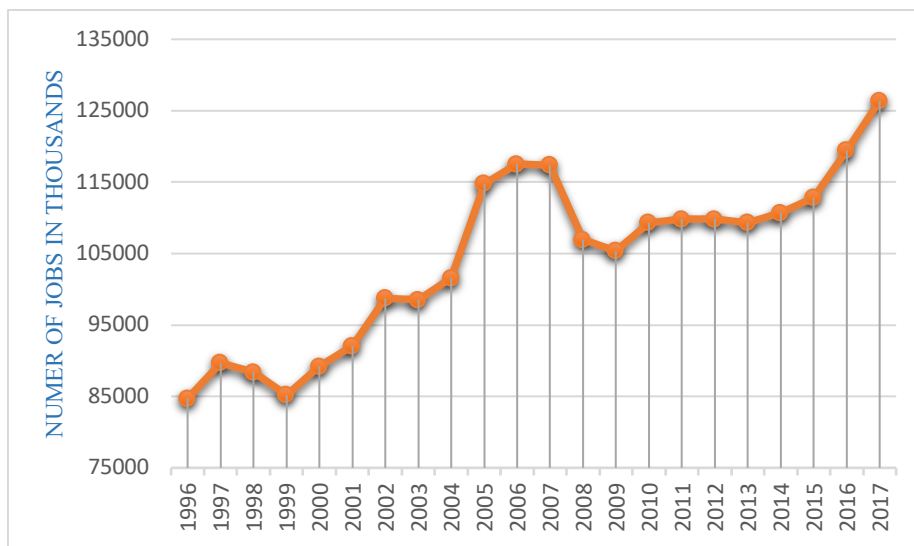


Source: Karatas, 2017

As can be seen, especially some regions as the Central Bohemia region is heavily dependent on the industry. Namely, regions around Hradec Kralove, Liberec, and the Silesia region are necessary for its work supply. As being illustrated by picture 2 number of employees is steadily growing over the 21 years. Just in the period from 1996 to 2017, the number of employees increased by 41 thousand in the last two decades. Some instability and decrease number of positions can be recognized just after 1997 and 2008 after the world economic crises. The most significant drop in numbers of positions was detected within 2008 and 2013.

To illustrate this, approximately 10 percent of employees were laid off in 2010. On the contrary, end the end of the crisis in 2013, the industry had then 8 thousand people less, but the manufacturing process increased.

Figure 14: Evolution of overall number of employees withing AIA within 1996-2017



Source: Michal Pícl, 2019

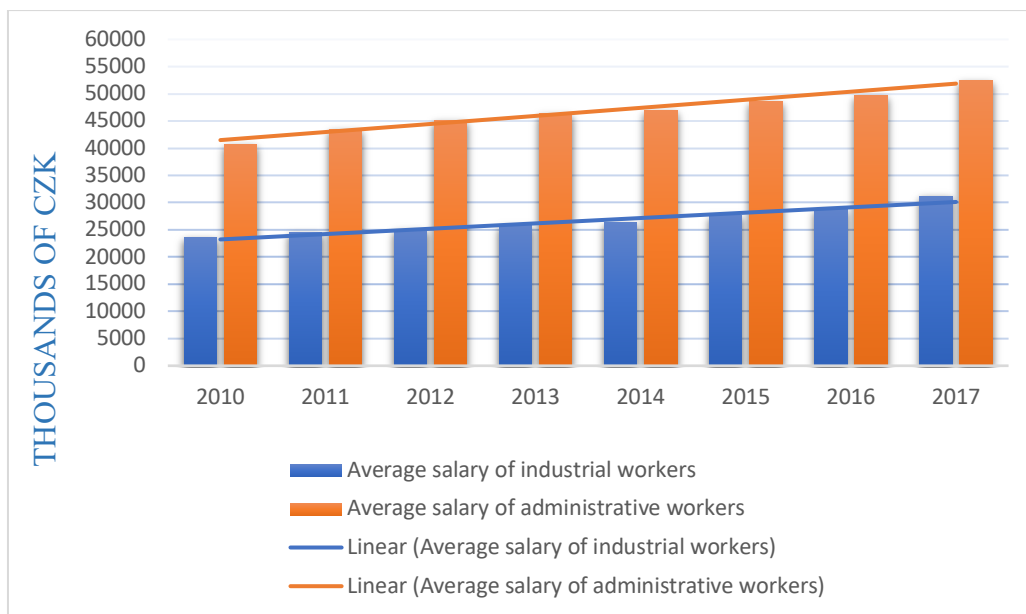
Based on the analysis made by Michal Pícl, job losses were detected mainly in companies that focused on components, not the final assembly firms. Another way final assembly company laid off about 3 percent of its people compared with 13 percent of components organizations. Looking at diversification by job description, the most considerable proportion of workers is blue-collar. In 2017, about 90 thousand jobs were designed for blue-collar works, and almost 37 thousand were assigned earmark for administrative workers. Across the Czech Republic, the manufacturing process firms are a guaranty of very competitive salaries (Pícl, 2019). Thanks to R & D's final assembly firms and infrastructure of R&D, the auto industry can provide a salary above the average in the Czech Republic. According to ACIA analysis, salaries have been rising at a 6 percent pace beside the financial crisis in 2008-2013 (ACIA).

On the other hand, there is no doubt that automotive production offers many opportunities for people and provides an above national average salary. However, the Czech Republic's salaries by multinational manufacturing companies are very often lower and under the salaries paid in the companies of origin. One can say that this is the reason why we do have that many labor intense firms in the Czech Republic, because of the cheap labor (Deloitte, 2019).

According to Michal Pícl, higher salaries in the industry attract people mainly from the public sector, such as school workers and health workers where salaries are not that

competitive. Report about the vehicle industry's future proves that the difference between firms that end the end of the vehicles' assembly is more likely to have a higher salary in 10 thousand of CZK compared with firms that produced the vital components. Even more significant uneven salary redistribution is examined between blue-collar workers and administrative workers. The resulting graph demonstrates the development of gross monthly salary with the comparison of blue-workers and administrative workers. Both examine segments accounted for 5 percent of the increase in average salary from 2003 – 2017. However, in last years' salary, administrative workers are growing more swiftly, as shown on the next page's graph (McKinsey, 2019).

Figure 15: Trend of gross salaries within automotive industry divided by the profession (CZK) between 2003-2017



Source: Pícl, 2019

Therefore, in 2017 the difference between these groups almost doubled. In 2017, the average salary for the intense labor worker was 31 272 CZK. On the other side, administrative workers had a gross average salary of 52 451 CZK. In other words, in the last 14 years of observed years, the gross salary increased by twice much as it was in 2003.

## **4.5 Future threats and their impacts on the automotive industry in the Czech Republic**

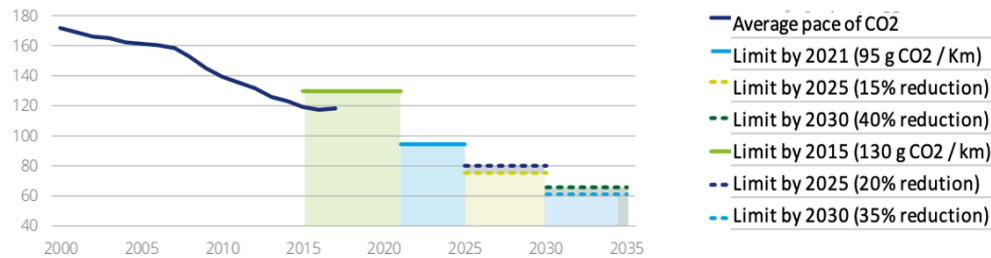
Several variables are going to have a result on the production of new vehicles shortly. Trends such as urbanization, climate challenges, technological and geopolitical aspects are going to impact industry globally. Countries across the globe dependent on car manufacturing will feel the consequences of new trends the most. Increasing population causes higher demand for vehicles, which will pressure manufacturing organizations to satisfy demand. Based on the many scientists' predictions and conducted research that proves that by 2030 shared mobility will be a leading form of transportation. The following trend can change the perception of the future marketplace. Global warming has been undisputedly one of our generation's most critical challenges (Deloitte,2019).

Therefore, we can witness prominent pressure on reducing vehicles' gases emissions into the atmosphere. Governments have to undertake particular techniques and strategies to satisfy the changing industry, putting pressure on automobile organizations. According to Michal Pícl, besides all stated challenges above, an extra factor that will face how automotive trade will look like is competition on the market between traditional business from Europe and USA and manufacturers from China (Pícl,2019). New trends within the industry will unquestionably significantly impact unemployment and national income in the Czech Republic. As being investigated, transportation is the second-largest producer of gasses emissions. The first position goes to the energy sector; however, still, 23 percent of gasses emissions are released due to transportation. Just car vehicles are responsible for 13,4 percent of gasses emissions.

Hence, there is relatively considerable pressure on decreasing gasses emissions through automobile infrastructure. Therefore, Paris Agreement was introduced as the primary basis for multinational cooperation on climate changes. The Agreement was accepted in December 2015. Its primary goals are to protect the climate and keep the increasing temperature under 2°C, plus involved countries have to fulfill its promises to reduce gas emissions. The Czech Republic is among nations that have promised to decrease greenhouse emissions by 40 percent until 2030 compared to 1990 (D'Alfonso, 2019).

The following figure shows the evolution and future goals that should be achieved to fulfill promises implied by the Agreement

Figure 16: Historical evolution of gasses emissions produced by passengers' cars g CO<sub>2</sub> / Km)



Source: Deloitte, 2019

The Agreements' commitments are to reduce CO<sub>2</sub> emission unleashed by car per one kilometer. For example, from 2015 to 2020 yearly limit produced CO<sub>2</sub> was 130 g per kilometer. If the vehicles' concerns do not fulfill the criteria, they must pay 95 EUR fees for each car that produces CO<sub>2</sub> over the limit.

#### 4.5.1 Electromobility

Increasing restrictions on the automobile industry shape a direction in which the industry must go. A study by Deloitte found that a change will not be realized just by technological progress because a lack of charging stations limits the whole infrastructure of electromobility. Hence, the industry will experience a boom of hybrid cars that would combine the traditional approach with electricity. The government's policy measurements are going to play a pivotal part in promoting electric vehicles. For example, to have a sufficient number of charging stations, the government must provide for households to build infrastructure at home. This method has already been implemented in Germany, France, or Norway (Deloitte, 2019).

Nevertheless, for the Czech economy, electromobility is not just the question of customers' preferences, but mainly the production of new electro-mobile vehicles. Mr. Pícl claims that switching from traditional engines to electrical transports will impact employment in the Czech Republic.

He argues that an electronic engine is not labor-intense and does not need that many additional parts as a traditional engine. This change in manufacturing engines would lead to decreasing number of jobs (Pícl, 2019).

Moreover, large vehicle producers are choosing various countries instead of the Czech Republic for their innovative products. For instance, Volkswagen has chosen the headquarters for its electromobility manufacturing in Hannover, not in Mlada Boleslav, where Skoda Auto is based. On the contrary, the Czech Republic was titled a significant producer of traditional engines, so almost all production is in the Czech Republic. Keeping in mind the trend and tendency to reduce CO<sub>2</sub> led us to question how much longer production of traditional engines would be sufficient for the market, most notably for the Czech economy (McKinsey, 2019).

However, suppose the demand for traditional engines shrinks in the long term. In that case, the Czech Republic will still produce auto parts with smaller added value for the economy. Based on Deloitte's analysis, we can see what would happen if the Czech Republic stops producing vehicles and its effects on the economy. Hopefully, this is not likely to happen shortly. However, the government has to be aware of changes within the business to protect the industry.

Hopefully, this scenario will not happen because, as we can see, it would have an extreme burden on the trade balance, employment, taxes, and the whole economy could collapse. For instance, overall production would decrease by 33 percent, and GDP would shrink by 25 percent. Approximately about 1.4 million people would lose a job; therefore, the unemployment rate would rise to 28 percent. If this scenario occurs, a household's disposable income will shrink across the industry by 23.7 percent. Unpaid salaries would significantly affect the national budget that will not receive approximately 460 billion CZK through taxes and unpaid insurance. (Deloitte, 2019)

Table 9: Impacts of relocation manufactures from the Czech Republic

<b>Production (billion CZK)</b>		Direct impact	Indirect impact
CR	<b>11 568 994</b>		
Impact on sales	<b>-3 813 983</b>	-725 475	-1 968 570
% from CR overall	<b>-33%</b>	-6,30%	-17%
<b>Gross value added (billion CZK)</b>			
CR	<b>452 562</b>		
Impact on GDP	<b>-1 154 400</b>	-87 563	-617 497
% from GDP	<b>-25,50%</b>	-1,90%	-13,60%
<b>Employment</b>			
CR overall	<b>5 346 092</b>		
Impact on employment	<b>-1 395 837</b>	-126 708	-742 640
% change in CR	<b>-26,10%</b>	-2,40%	-13,90%
<b>Salaries (billion CZK)</b>			
CR overall	<b>2 088 701</b>		
Impact on households income	<b>-495 505</b>	-58 674	-269 606
% impact	<b>-23,70%</b>	-2,80%	-12,90%
<b>Impact on public finances (billion CZK)</b>		Budget	
Taxes from legal person	<b>-78 878</b>	-53 242	-7 036
Taxes from legal entities	<b>-76 136</b>	-51 391	-6 791
No direct taxes	<b>-151 169</b>	-154 189	0
Social Insurance	<b>-154 189</b>	-12 309	-8 785
Overall	<b>-460 371</b>	-380 132	-22 612

Source: Deloitte, 2019

Deloitte provides a second example that favors the positive implementing of electromobility in the plants across the Czech Republic. However, today's situation does not look like the following scenario likely to happen due to many Czech Republic limitations. If the Czech government and Czech manufacturers plants would produce batteries and other essential parts correlated with electric vehicles, then the following financial consequence happens. Overall production within Czech borders increases by 5.4 percent, which drives to a 5.7 percent increase in GDP. Increasing production by 5.4 percent would create approximately 213 thousand new workplaces. The national budget would get approximately 102 billion CZK annually more. However, as being explained for big businesses, the Czech

Republic is not viewed as the country for innovative electricity or technological progress; therefore, we could almost certainly say this scenario will not happen (Deloitte,2019).

#### **4.5.2 Impacts of shared and autonomy vehicles on the Czech economy**

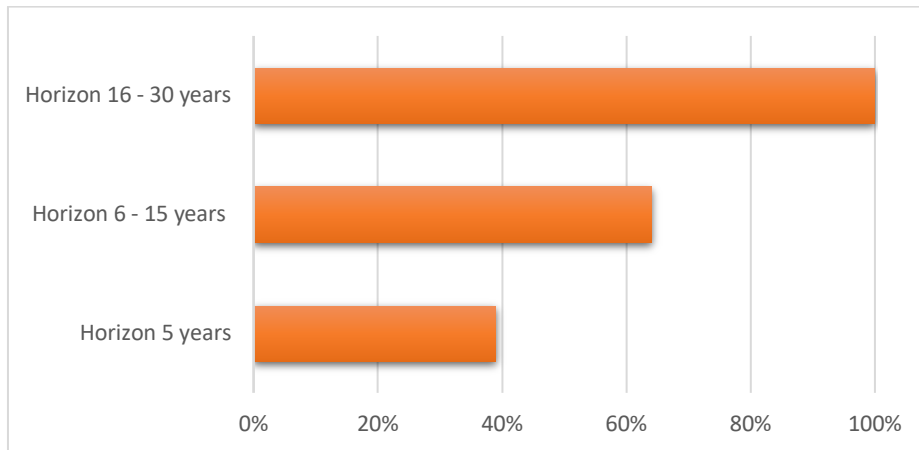
According to Deloitte's research, autonomous transportation would be a very demanded factor, and in the future, every vehicle would have this feature. Based on the household's income, people would be willing to pay for autonomous cars. Economic impacts would be primarily correlated with taxi drivers, bus drivers, commercial vehicle drivers, etc. Autonomy vehicles would bring more profits for companies; however, the extra profit should be invested into research and new technologies. In other words, the most significant danger of losing jobs would be in transportation and storage transportation, where 74 percent of employees would likely lose their jobs that is equivalent to 182 thousand jobs (Deloitte, 2019).

#### **4.5.3 Digitalization**

Digitalization is a particularly relevant part of today's world. However, one of the advantages of the Czech Republic comparing with other nations is the advantage of relatively cheap labor that is in contrast with technologies. That is why some car companies have their plants on our territory. As Mr. Pícl says, robotization, automatization, and digitalization persist not that spread due to cheap labor costs for companies in the Czech Republic. The manufacturing process is nearly based just on simple, understandable manual work (Pícl, 2019). According to many study cases, nations with economic and manufacturing processes are based on easy and mid easy tasks such as assembling cars, so these nations would face the unprecedented danger of losing working places (Deloitte, 2016). There is strong evidence that traditional jobs will be jeopardized due to artificial intelligence. The following graph demonstrates how fast some of the jobs disappear. In the following five years, there will be intense pressure on workers working at an assembly line.



Figure 16: Percentual changes of vanishing manual workers from the industry in time



Source: Own elaboration based on data from TC AV ČR

Based on the investigation, approximately 40 percent of assembly workers would be laid off. As we can see from the graph in next 6-15 years, the proportion would be almost 70 percent, and in 30 years, no workers will not be needed at the assembly lines (Pícl, 2019). The case study directed by Deloitte also demonstrates the potential of automatization and robotization as a challenge for the Czech nations. Thanks to automatization, productivity rapidly increases that trend would have a positive impact on GDP and salaries. Additionally, if an adaptation of new technologies goes smoothly, we can expect an increasing pace of growth. In the next 16 years, the growth should speed up by 3.9 percent annually, and the potential of the economy would increase by 78 percent end the end of 2033. However, the most crucial responsibility is to ensure that extra profit generated by automatization would stay within the country's borders and employees and the economy will benefit from it (Deloitte, 2016).

Most Czech Republic manufacturing companies have owners from different countries; therefore, profits are not usually reinvested in the Czech Republic. According to Michal Pícl, new technologies are implemented very slowly comparing with other countries. As explained, the previously slow process of integrating new technologies is mainly caused by cheap labor, so the companies do not intend to implement new processes. (Pícl, 2019) Unwillingness to implemented new technologies could cause the Czech Republic to be obsolete and unable to compete with other countries (Deloitte, 2019).

## 5 Results and Discussion

In the Czech Republic, the automotive industry has been playing a very significant role since 1898. Since then, the industry went through many phases of its development. After World War II in 1946, the government controlled all manufacturing firms. Another milestone came in 1989 when most companies had changed their ownership structure from state-owned to privately owned. Substantial firms continued producing, and weaker companies failed. However, in the privatization period, more and more companies were owned by foreign investors. Indeed, vehicle production is one of the pillars of the economy. Just the production accounts for 24 percent of the whole production in the country.

Moreover, the industry is responsible for almost 10 percent of the whole GDP and 22 percent of the Czech's export. Despite all of that, the automotive industry is a crucial employer across all Czech Republic regions. In 2017, the industry provided labor for more than 126 thousand workers plus another 20 thousand workers indirectly. Nowadays, the industry faces unprecedented changes and challenges due to many variables such as urbanization, automatization, global warming, electromobility, and shared transportation. Despite all of these challenges, the Czech Republic should be ready to keep the country's automobile industry's prosperity.

Unfortunately, our country did not take the electromobility initiative seriously; therefore, we are already behind some countries such as Germany, France, Norway that are already building essential infrastructures for electromobility. Suppose the Czech Republic will not be able to create charging stations. In that case, the whole industry is probably going to suffer. Giant multinational corporations may decide to leave the Czech Republic because of its obsolete technologies. As emphasized already, the concerns may keep traditional engines' production in the Czech Republic; however, traditional engines will not last for long. Besides the electric cars, self-driving cars represent the future on the market with vehicles. However, one of the vital changes of the industry is going to be digitalization. Czech government and firms have to prepare firms for digitalization which can jeopardize some job positions. However, it is essential to keep up-to-date technologies within a country. Unluckily, the decision-making process of implementing new technologies is in foreign owners' hands that sort of sets direction for the industry. Additionally, Czech AI and the Czech government representatives should rethink the structure of the automotive industry. Until now, Czech Republic offers initial funds to attract them to open the new assemblies' lines. Based on

Michal Pícl, these initial funds should be mainly focused on more strategic types of projects. Such technologies and artificial centres would require more complex training centres for Czech citizens to keep being competitive. Another thing that could help the industry is to set the decision-making process on the organization's and employees' level. This approach is implemented in Germany, where a complex decision-making process ensures stability and long-term vision.

## Conclusion

The first part of the paper provides a fundamental theoretical background of foreign trade. The theoretical part examines advantages and disadvantages. The paper covers leading country and firms-based theories in terms of foreign trade. Additionally, the theoretical part provides insight into the automobile industry, its history, production globally.

In the second part, the paper analyses the Czech Republic's foreign trade, focusing on the automotive industry and its importance for the country between 2010 - 2019. Furthermore, lastly, the paper emphasizes future threats and challenges which will impact the industry.

In 2019, the Czech Republic exported a total of 3.538 billion CZK, making it the number 27 exporter globally. The most recent exports are led by cars with a value of 500 billion CZK and vehicle parts representing 336 billion CZK. The automotive industry has been one of the country's pillars, both in terms of economic performance and of the labor market. From 2010 - 2019, the Czech Republic's international trade had an upsloping trend that led to a positive trade balance annually. The paper investigates correlations between the industry and its economic impacts. The Czech Republic belongs among countries that are unconditionally dependent on the industry. The sector directly employs approximately about 160 000 people across the Czech Republic; moreover, about 400 000 jobs are indirectly correlated with the automobile trade. In 2017, the Czech Republic represented 13.7 percent of direct employment share in total manufacturing in Europe and the United Kingdom. The industry is considered one of the essential public employers covering about 10 percent of all industrial workers and providing highly competitive salaries. For illustration, in 2017, the average wage for industrial workers was 31 272 CZK. For administrative workers, it was 52 451 CZK monthly representing the median at 43 949 CZK. Overall, employers' average salary within the industry is approximately 26.8 percent higher than the average national wage. In 2019, Skoda, Hyundai, and joint ventures produced over 1.46 million vehicles in the Czech Republic. Together that made up about 10 percent of its gross domestic product. The sector accounts for 23 percent of industrial output in a heavily industrialized and export-oriented economy. Despite the current economic crisis, the industry's revenue will be decreased by 19 percent representing minus 200 billion CZK. The export is significantly dependent on Germany that represents one-third of the Czech export. However, the industry faces significant challenges in the near future, such as electromobility, autonomous transportation, decreasing emissions limits, and digitalization, explaining the importance of the industry for the economy. All of the mentioned following trends could negatively impact the Czech

industry unless the country and manufacturing companies take appropriate steps to be competitive with other nations across the globe. The Czech Republic should continue digitalizing the country, so we will not be just a place known as an assembly country. If the country undertakes the proper steps, we would still compete and benefit from the automotive sector.

In conclusion, the paper strongly suggested measurements that should be implemented to maintain the automotive industry's status in the Czech Republic. Nowadays, the industry is going through fundamental changes that will undoubtedly influence how the industry will look. The Czech Republic has been aware of technological improvements. Otherwise, the industry will be jeopardized. The country will face some severe problems due to dependency on automobile dependence. As being examined, international trade directly impacts employment and stability of the economy; therefore, the Czech Republic must analyze the risks that could negatively harm the industry. Therefore, the Czech Republic should continue the digitalization of its regions. Through grants such as HORIZON that the EU provides, the country should initiate a more aggressive approach to establish innovations, recharging stations, and infrastructure needed for autonomous transportation. To have a healthy economy and for the automotive industry, prosperity is the key to maintain being a part of the European Union.

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