**T.R.**
**YILDIZ TECHNICAL UNIVERSITY**
**SOCIAL SCIENCES INSTITUTE**
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**ENGLISH ECONOMICS PROGRAMME**

**MASTER'S THESIS**

# THE IMPORT DEPENDENCY OF THE AUTOMOTIVE SECTOR IN TURKEY (2000–2018)

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**THESIS SUPERVISOR**
**Prof. Dr. FERİDE GÖNEL**

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**Thesis Defense Date: 08.06.2021**

**Thesis is Found Successful with Unanimity.**

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**İSTANBUL**
**JUNE, 2021**

# ABSTRACT

**THE IMPORT DEPENDENCY OF THE AUTOMOTIVE SECTOR IN TURKEY**
**Tuğçe Aydemir**
**June, 2021**

While Turkey is included in the global value chain accompanied by globalization and vertical specialization, Turkey's foreign trade volume has been increasing year by year. Export is a significant driver in terms of economic growth and development. Turkey, which is located in the World's top 20 largest countries, aims to reach export target of 500 billion dollars in 2023. However, the value-added of exported commodities that provide, has been continuing to decrease until last a few years gradually. Turkey is one of the most important commercial vehicle producers in Europe. Undoubtedly, the reasons of Turkey's attraction are that Turkey stays on an important geographical position and its population. Despite increasing automobile production and market share within years, increase in export of automobile starts to create less value-added due to using of imported inputs. Although this situation follows a fluctuating course, it reflects a general trend. Import dependence of Turkey is mentioned with a sectoral perspective in this study. Firstly, the foreign trade of Turkey is interpreted with the help of 1980-2018 data. After that, as mentioned above, automotive sector, which plays a key role in Turkish Economy as an example sector, is discussed. The data of UN Comtrade, TUIK and Automotive Manufacturers Association is obtained to analyze sectoral. The sector is a key sector due to the fact that it creates business districts in other sectors and it is also the top export sector in Turkey after 2003. In the last part of the study, the automotive sector, which attains such a substantial success, the import dependency of the sector is exhibited and it is aimed to draw attention to the problems that is created from this case. Moreover, this study is mentioned about some short suggestions.

**Key Words:** Import Dependency, Automotive Parts & Components, Export, Import, Global Value Chain, Vertical Specialization, Intra-industry trade, Interdependence

# ÖZ

**TÜRKİYE'DE OTOMOTİV SEKTÖRÜNÜN İTHALAT BAĞIMLILIĞI**
**Tuğçe Aydemir**
**Haziran, 2021**

Küreselleşen dünyada Türkiye, dikey uzmanlaşmanın eşlik ettiği bir küresel değer zincirine dahil olurken, dış ticaret hacmi de her geçen yıl artmaktadır. İhracat, ekonomik büyüme ve gelişme açısından önemli bir itici güçtür. Dünyanın ilk 20 büyük ülkesi içinde yer alan Türkiye'nin amacı 2023 yılında 500 milyar dolarlık ihracat hedefine ulaşmak olmasına rağmen, ihraç edilen mallardan elde edilen katma değer son birkaç yılda azalma seyri göstermektedir. Avrupa'nın en önemli ticari araç üreticilerinden biri olan Türkiye'nin bir cazibe merkezi olmasının nedenlerinden biri hiç şüphesiz ülkenin coğrafi konumu, bir diğer nedeni ise nüfusudur. Yıllar içinde artan otomobil üretimi ve pazar payına rağmen otomobil ihracatındaki artış, ithal girdilerinin kullanılması nedeniyle daha az katma değer yaratmaya başlamıştır. Bu durum zaman içinde dalgalı bir seyir izlese de genel bir trendi göstermektedir. Bu çalışmada, Türkiye'nin ithalata olan bu bağımlılığından sektörel bir bakış açısıyla söz edilmiştir. Bu çalışmada önce Türkiye'nin dış ticareti kısaca 1980-2010 verilerin yardımıyla yorumlanmış, ardından örnek sektör olarak, Türkiye ihracatında yukarıda da bahsettiğimiz gibi önemli bir rol oynayan otomotiv sektörü ele alınmıştır. Sektörel analiz yapabilmek için UN Comtrade, TÜİK ve Otomobil Sanayii Derneği'nin verilerinden yararlanılmıştır. Sektör, diğer sektörlerde iş bölgeleri yaratması nedeniyle kilit bir konumdadır ve aynı zamanda 2003 yılından sonra Türkiye'nin en büyük ihracat sektörüdür. Çalışmanın son kısmında, ihracatta bu denli önemli bir başarı elde eden sektörün ithalata olan bağımlılığını ortaya koyarken, bunun yaratacağı problemlere dikkat çekilmek istenmekte, ayrıca bazı kısa önerilere değinilmektedir.

**Anahtar Kelimeler:** İthal Bağımlılık, Otomotiv Aksam ve Parçaları, İthalat, İhracat, Küresel Değer Zinciri, Dikey Uzmanlaşma, Karşılıklı Bağımlılık

## PREFACE

This thesis is written to prove import dependence of Turkey with a selected sector. The automotive sector is Turkey's critical sector due to being the most export sector. Hence, Turkey's automotive sector is analyzed in terms of foreign trade, sale, and production. Export and import automotive sector's codes are collected from UN Comtrade. After that, interdependence ratio, vertical specialization and intra-industry trade are calculated, and they present an overall picture to us.

Firstly, I thank to my parents, who has always been with me in all circumstances for their supports in this process. Second, I want to thank to Prof. Dr. Ensar YILMAZ for his helping me to determine my thesis subject. Finally, I would like to thank to Prof. Dr. Feride GÖNEL for that she has encouraged, and she has guided me. I am grateful to my thesis supervisor for everything that she has offered me different approaches and she has instructed me.

To my family…

İstanbul; June, 2021 Tuğçe Aydemir

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## ABBREVIATES

| | |
|---|---|
| **GDP** | : Gross Domestic Product |
| **FDI** | : Foreign Direct Investment |
| **HS** | : Harmonized System |
| **ICT** | : Information of Communication Technology |
| **IDR** | : Interdependence Ratio |
| **IOT** | : Input-Output Table |
| **OSD** | : Otomotiv Sanayii Derneği |
| **RCA** | : Revealed Comparative Advantage |
| **TIVA** | : Trade in Value-added |
| **UN Comtrade** | : United Nations Comtrade Database |
| **VS** | : Vertical Specialization |

# 1. INTRODUCTION

Export is a significant driver in terms of economic growth and development. Countries acquire foreign currency inflow thanks to export and when countries export more, intermediate inputs and capital goods are imported much more. Besides, export sparks increasing employment ratio off in countries. Increased exports result in improved productivity, technological development and importation.

Undoubtedly that industrialization plays an important role in economic growth. Whereas source of income growth was agricultural sector in 1950s years, manufacturing industry was driving force in economic growth of Turkey, after 1960 (Pamuk, 2017, 255). Turkey embraced the import-substitution industrialization policy as from 1960. In the same years, the economies of Europe countries entered into the process of speedy recovery. Turkey also pursued economic trends of in the World. As in other countries, export-oriented growth has been gotten through in Turkey in 1980 and industrial production turned towards export. Globalization notion came into our lives from there to here. 24$^{th}$ January decisions revealed globalization, vertical specialization, and global value chain notions. The fragmentation of production emerged with all these developments. Most of countries have canalized this international production organization model so that countries were in interaction with other countries. Dependency has been the expected result in these circumstances. Multinational companies also supported this formation. Because multinational companies created an expansion of production in a different countries vis-a-vis comparative advantage (Erkök, 2019). According to Trade in Value-added (TİVA), value-added in gross export increased by 172,85 and value-added in gross import went up by 133,97% between % in Turkey between 2005 and 2015 years. In other words, Turkey has taken a share from the global production system.

We can say that automotive, food, chemical, textile, consumer durables goods are the most global sectors. As given an example from domestic companies, Arçelik which produces consumer durables goods, has 10 production plants abroad. Şişecam which produces flat glass, is expanded 6 different countries with 10 production plants. On the contrary, Unilever is a huge company that

produces personal care and food. It sets up 8 factories in Turkey. Renault affiliated with Koç Group and it was produced in Turkey.

Turkey's automotive adventure has been based upon 1930s. Turkey produces first successful domestic car with Ford's incentives in 1966. After that, Chrysler, Renualt, MAN, Opel, Toyota entered the country within years. Automotive production comes true via assembling industry. Some parts and components produce in Turkey, but a good a part of them is imported. Turkey depends on foreign origins automotive firms for lack of domestic automotive brand. However, foreign corporations set up very much automotive production plants. Automobiles which produce in Turkey, involves imported inputs at this stage. Turkey has entered the global production system with export-oriented industrialization.

Integration of global value chain is also important in terms of competition, productivity and accession of technology and inclusion of a global production system are suggested for developing countries. Turkey makes an effort as from 2000s on this point. On the other hand, when Turkey specialized in agricultural production and textile sector, motor land vehicles and machinery sector gained importance both in production and in foreign trade by year 2000s. This situation brings problem in the way of specialization of in new sectors. Turkey is faced with less value-added. Because global value chain causes to increase usage rates of imported inputs and goods so that domestic emerging sectors are adversely affected.

This thesis is written to inquire the position of Turkey in terms of trade and production. Questions are answered, like does Turkey produce high value-added produces, does Turkey get the best of exported goods when Turkey exports what it produces, how does globalization affect automotive sector. Import dependence of Turkey is mentioned with a sectoral perspective in this study. Turkey's foreign trade is interpreted via the 1980s,1990s, and 2000s data. The automotive sector plays an important role in export of Turkey. The sector is a key sector since it creates business districts in other sectors, and it is also the top export sector in Turkey after 2003. Considering all of these, the automotive sector is deeply analyzed in this study.

Turkish foreign trade is mentioned in part 2 and pre-2001 and post-2002 are discussed. Turkish foreign trade is divided into two sections as pre-2001 and post-2002 to approach recent history. But pre-2000s history affects foreign trade tendency of these days. Therefore, Turkish foreign trade is researched in its entirety between 1980 and 2019 years so as to evaluate state of affairs. In

following part Turkish automotive sector is referred. An assessment of its production, sale and foreign trade is included in this part. Part 4 is associated with literature review. The articles which do empirical study, are integrated into the thesis. Method and data are used in the thesis, is mentioned in part 5. Finally, empirical analysis exists in part 6.

## 2. A BRIEF OVERVIEW ON TURKISH FOREIGN TRADE OF 1980-2019S

The Turkish foreign trade section is divided into two periods due to the fact that two periods are understood better and gap between is noticed easily. Two periods comprise different foreign trade policies, different production systems and they also diverge with experienced economic events and conjuncture. Two periods require to interpret Turkey's import dependence. After that, selected sector is researched extensively so that this study paints a picture of the general to the specific. When automotive sector is discussed, Turkish foreign trade part has gained importance due to cause-and-effect relation.

### 2.1. Turkish Foreign Trade Pre-2000/2001 Period

None of countries in the world carry out closed economy policies in these days. The key behind this effect is Keynesian Policies were not useful so that market mechanism was considered as a starting point since the recession of 1970s (Pamuk, 2017). After 1980, trade trend was export oriented growth that contributed globalization and vertical specialization. Market system internationally meant that trade barriers are facilitated. Especially, the developments in the field of information of communication technologies (ICTs) and transportation removed the borders. Export oriented growth accompanied trade liberalization so that international trade volume has been rapidly increasing in this context. Based on these changes, market share and competitiveness have taken form.

Turkey has accepted the export oriented trade policy with 24$^{th}$ January Decisions. Trade liberalization and foreign capital were promoted by the government. Initially, the government (ANAP) prohibited imported commodities in 1983 (Pamuk, 2017). Parallel to export oriented trade policy and globalization, within the framework of export orientation and global atmosphere, such movement was remarkably risky for the country. It would be said that other countries also started to open their own economies to the World. This situation caused disadvantages for emerging countries. Because accessing of imported

commodities has been easy for consumers and producers. However, 1980s generally overperformed in terms of rise in export. According to statistics, export was around the 2.9 billion dollars in 1980, 8 billion dollars in 1985 and 11.6 billion dollars in 1989. The import was 7.9 billion dollars in 1980, 11.3 billion dollars in 1985 and 15.8 billion dollars in 1989. Therefore, Export/Import Coverage Ratio was high except for 1980. Export/Import Coverage Ratio reached 81% levels thanks to increasing export at the and of the 1980. The pie charts depict that Turkey's the most exports to 5 countries were Germany, Italy, Russia Federation, France and Iraq. Turkey's top 5 import partners were Iraq, Germany, Iran, Libya and the USA in 1980. At a glance, the production of machine, chemical, textile and other non-agricultural sectors were ignored before 1980s, it can be seen that the manufacturing value-added of Turkey increased 110,7% between 1980-89. That is why 1980s are the epitome of structural change in this respect.

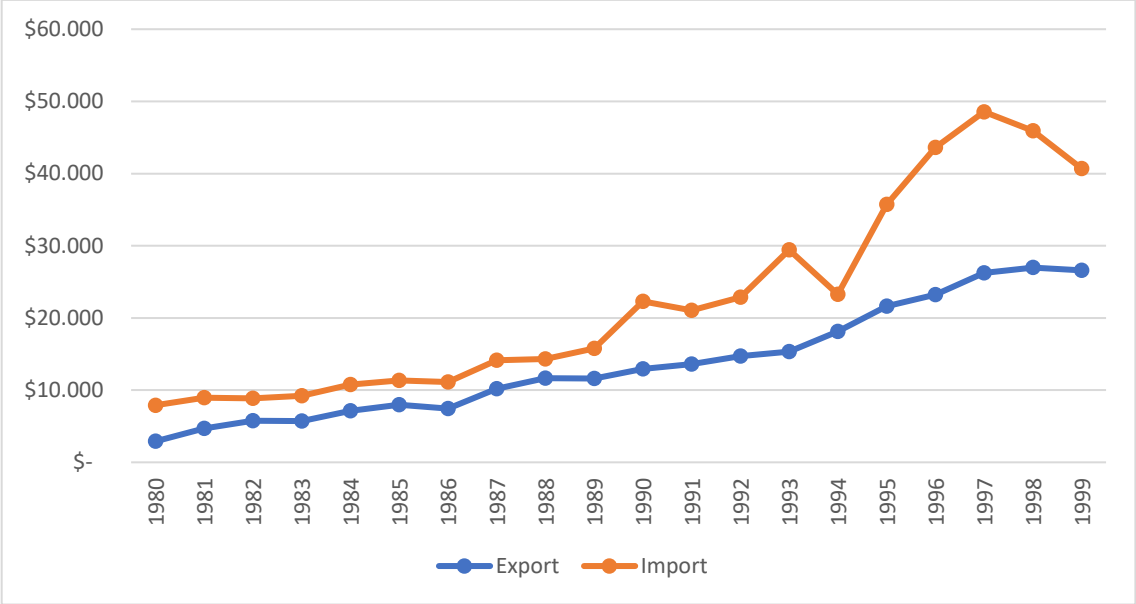


**Figure 1: Turkey's Export and Import (1980-1999) million ($)**

World Trade Organization Data. [11.04.2020]. https://data.wto.org/

After it has been approached the change in 1980s, the study focused the Turkish Economy in 1990s. The 1990s witnessed the recession years from 1990 to 2000.Hence, to face the recurring problems were inevitable. One of these problems was that Turkey's Economy was sensitive to the external shocks. In addition to this, foreign borrowing caused much more current deficit to occur. Furthermore, fluctuation in exchange rate

contributed to current account deficit. In 1994 Turkish Liras depreciated almost 13,3% against the dolar. Depreciation on TL was shown by 90% in 1999. Although these fragile experienced in 1990s, export and import have never decreased in Turkey during this period. As summarized first figure, export and import did not show an outstanding change until 1998. Export was approximately 13 billion dollars in 1990, 21.6 billion dollars in 1995 and 26.6 billion dollars in 1999. The import was 22.3 billion dollars in 1990, 35.7 dollars billion in 1995 and 40.7 billion dollars in 1999. In a brief, export and import accelerated compared with 1980s. Export increased by 67% between 1990 and 1995, by 23% between 1995 and 1999. Import went up 60,1% from 1990 to 1995 and 14% from 1995 to 1999. In 2000s import rapidly would increase.

Customs Union Agreement with EU was the best important emerging development in this period. Commercial relations have been always dynamic between EU Countries and Turkey. Namely, export restrictions abolished for both Turkey and EU countries. Indeed, the aim of The Customs Union Agreement augmented trade and investment in Turkey and EU. During this period, when Turkey's exporters and importers partners carefully examined, it is observed that Turkey's top 5 export partners were Germany, Italy, USA, UK and France therewithal top 5 importers partners of Turkey were Germany, the USA, Italy, France and Russia Federation in 1990. After 1990s, the pie charts below demonstrate that Turkey’s exports have shifted toward Arap countries as of 2000.

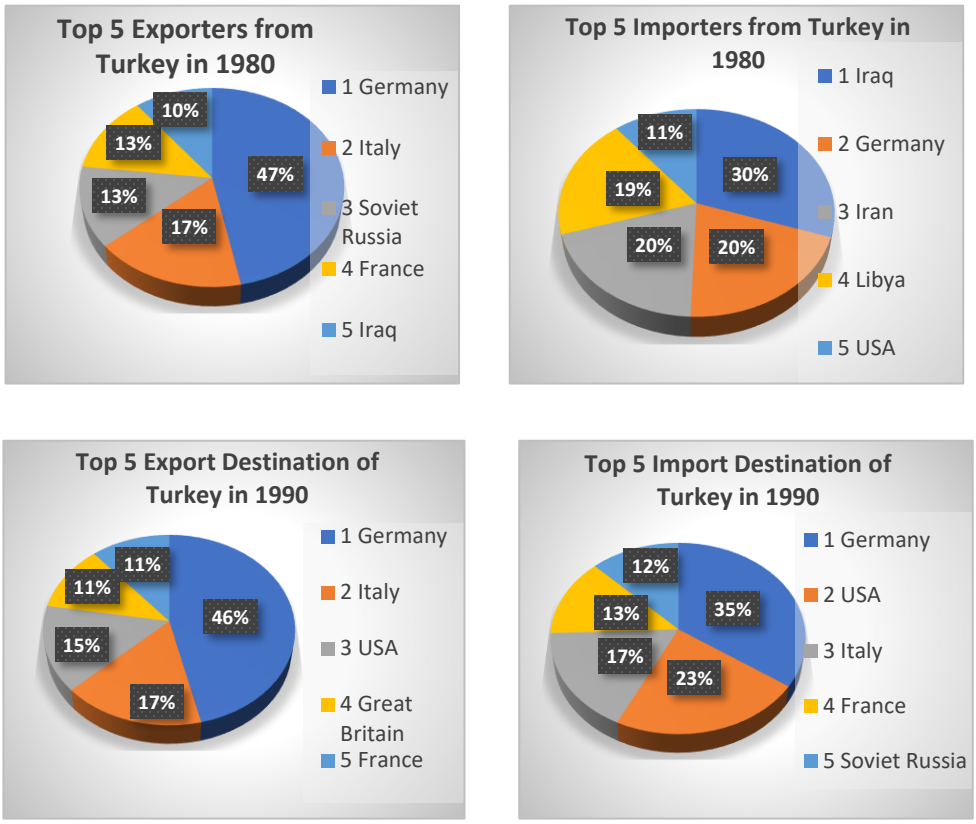


**Figure 2: Top 5 Exporters and Importers from Turkey in 1980 and 1990**

Turkish Statistical Institute. [11.04.2020]. https://data.tuik.gov.tr/Kategori/GetKategori?p=dis-ticaret-104&dil=1

In a numerically brief, Export/Import Coverage Ratio in 1990s was not as high as Export/Import Coverage Ratio in 1980s. Export/Import Coverage Ratio was 58% in 1990, 61% in 1995 and 65% in 1999. It is a well-known fact that Turkey have been tending capital-intensive sectors. This factor probably played a crucial role in the decrease of Export/Import Coverage Ratio. Manufacturing value-added of Turkey, especially increased after 1990s. Based on WTO, Turkey's exports of manufacturers were 8.78 billion dollars in 1990, 17 billion dollars in 1996 and 20.85 billion dollars in 1999. Turkey's imports of manufacturers were 13.63 billion dollars in 1990, 29.55 billion dollars in 1996 and 29.87 billion dollars in 1999. Statistically speaking, manufacturing value-added of Turkey went on increasing at the ratio of 5,13% between 1990-99. Thus, we can understand looking at manufacturing value-added that industry sectors increasingly became more important in Turkey.

The current account deficit was not outstanding until 1993. After 1993, Turkey faced current account deficit. At first glance, current account deficit in 1993 announced that the crisis in 1994 was going to hit in Turkey. According to Figure 3, the current account of Turkey in 1991 was 250 dollars, in 1993 - 6.433 dollars and -925 dollars in 1999. Actually, current account deficit has displayed a persistence deteriorating trend during 1998-2007 period (Kara, 2014).

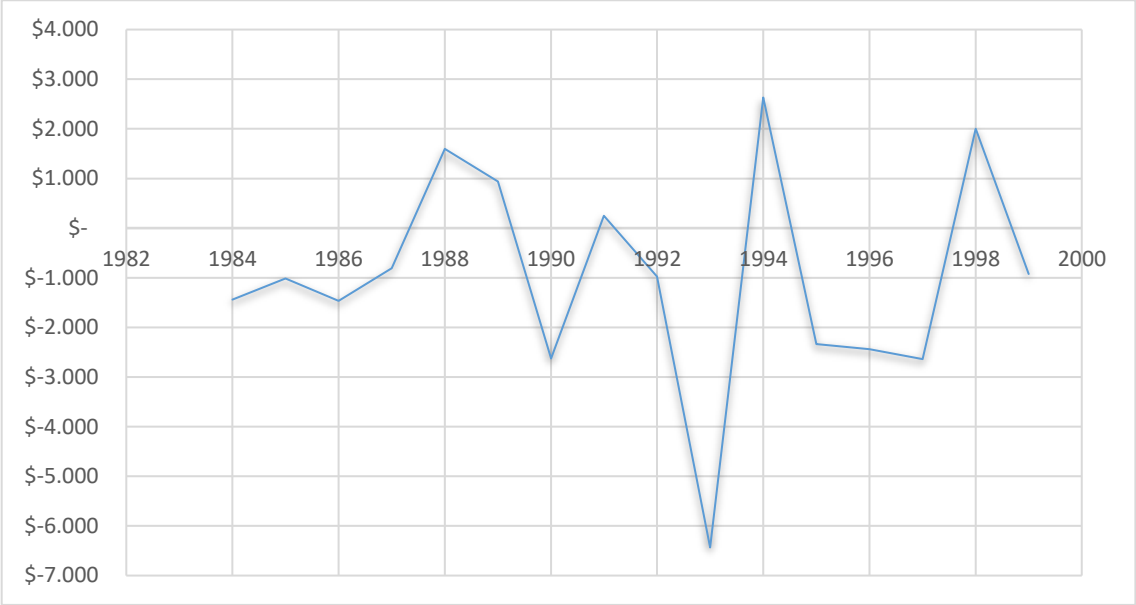


**Figure 3: Turkey's Current Account (1984-1999) ($)**

Central Bank of The Rebuplic of Turkey. [11.04.2020]. Ödemeler Dengesi İstatistikleri. https://www.tcmb.gov.tr/wps/wcm/connect/TR/TCMB+TR/Main+Menu/Istatistikler/Odemeler+Dengesi+ve+Ilgili+Istatistikler/Odemeler+Dengesi+Istatistikleri/

In this part of the study, Turkey's competitive advantage in the 1980s could not be accessed. On the other hand, 1990s' data was available. According to RCA, hides and skins (7,31) were first, textiles were second (6,95) and the third one was vegetable (3,03) in 1990. At the end of 1990s, textiles had still the most competitive advantage (6,22), the second competitive advantage sector was vegetable (2,94) and the third one was minerals (2,89).

## 2.2. Turkish Foreign Trade Post-2002 Period

2000s have almost identified with the Justice and Development Party (AKP) neoliberalism. After the 2001 crisis, AKP formed government alone. In parallel with one-party government, the growth rate of Turkey went up until global crisis. That is why, import rapidly increased together with export. But export remained low as against import. Therefore, Export/Import Coverage Ratio was in 2000 %51, in 2010 %61 and 85% in 2019- after 1988, 85% was the highest Export/Import Coverage Ratio.

2000-2001, 2008-2009, 2014-2015 and 2018-2019 can refer to problematic years. In these years, Turkey struggled with Exchange rate fluctuation, price volatility, national and global crises, external shocks, inflation pressure, slowdown in developing countries' demand.

A short examination of the fourth figure, there are four stages of fall in imports in Turkey. Export just fell in 2009 and 2015. First, import in 2001 was a 24% decrease and export increased by 12,8% in comparison with the previous year. Because of the 2001 crisis, the import was in the course of decrease. Second, there was a striking decrease in the import of 2009 (approximately 30,2%). A similar Picture was observed for exports. Export fell by 22,6% in 2009. Mortgage Crisis contributed unemployment and growth of Turkey adversely. The setback in foreign trade was seen almost all developed countries and emerging countries.Third, either import or export decreased in 2014-2015. Import declined by 14,4% between 2014 and 2015 in Turkey, although import increased 1,7% in quantity. As is seen from fourth figure, this fall was 8,73% in export. Why did a fall in this period burst? It is focused on clarifying this question: the growth of developing countries and foreign demand tended to be in a downward trend. In addition, Turkish Lira depreciated 20% in this period. Central Banks normally started to carry out the lowest interest rate after the global crisis. But FED chose vice versa policy in 2015. As a given example of external events, when FED increased interest rate, Turkish Liras automatically depreciated. As a result, import became more expensive. Therefore, the foreign trade deficit was reduced to 63.3 billion dollars. Export was affected by foreign demand and import came under the influence of a rise in Exchange rate.

From the fourth figure it is apparent that there is a difference between export and import from 2010 to 2013. Since low interest rate of developed countries led to appreciate on TL. According to TİM Report, gold played a considerable role for an increase in import. Although there was a some problem among the economies of developing countries, World Trade boomed after 2011.

Finally, fall in import is shown from the fourth figure for 2018-2019. Exchange rate sharply rose, so import decreased by 9,1% in 2019. Turkey has not completely overcome the recession. We readily assume that Turkey has been encountering a recession since 2018. There has been still a depreciation on TL. The value of assets gradually continues to decrease. Reflecting all aspects to the international trade, import has decreased in Turkey since 2018. However, export in Turkey is still low in point of value-added in comparison with developed countries. Looking at the manufacturing value-added figures, Turkey obtained increase approximately 128% for 2000-2010 periods. However, the manufacturing value-added in 2010-2018 period was 26%. It has been proceeded from a numerical point of foreign trade, export was 27.8 dollars in 2000, 113.9 dollars in 2010 and 171.5 dollars in 2019. The import was 54.5 billion dollars in 2000, 185.5 billion dollars in 2010 and 202.8 billion dollars in 2019.

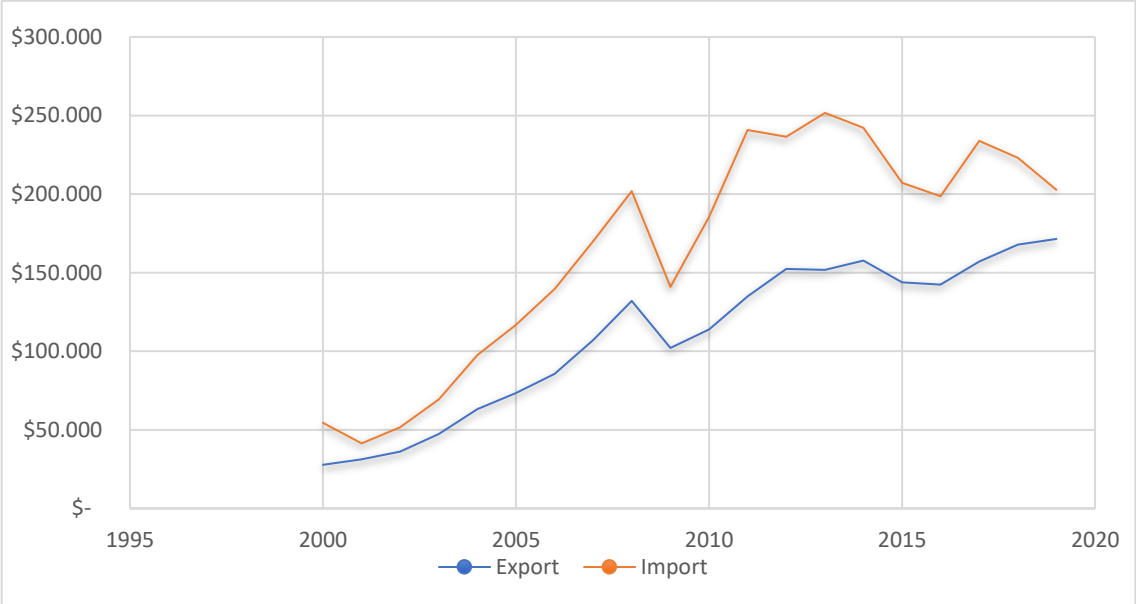


**Figure 4: Turkey's Export & Import (2000-2019) million ($)**

World Trade Organization Data. [11.04.2020]. https://data.wto.org/

According to Figure 5, deterioration in the current account is seen after 1999. Turkey's growth began to increase steadily from 2000 to 2007. Consequently, import which also showed, was in an uptrend. Current account hit bottom of the downtrend together with 2011. As of 2012, downward trend arose fractionally. Except for 2001 and 2019, the current account has a deficit in 2000s. I can make an inference that when a recession hits Turkish economy excepting global crisis, import and current account fall into a decline.

It has been underlined that Turkey concentrated Middle East countries in terms of bilateral trade from 2001 to today. As export partners of Turkey were predominantly EU countries, Middle East (Iraq) took place on top 5. Russia continued to come out on top, so Russia was a top importer partner in 2019. Top 5 exporters partners of Turkey in 2019 were Germany, Great Britain, Italy, Iraq and USA. Top 5 importers of Turkey in 2019 were Russia, China, Germany, secret country, and USA.

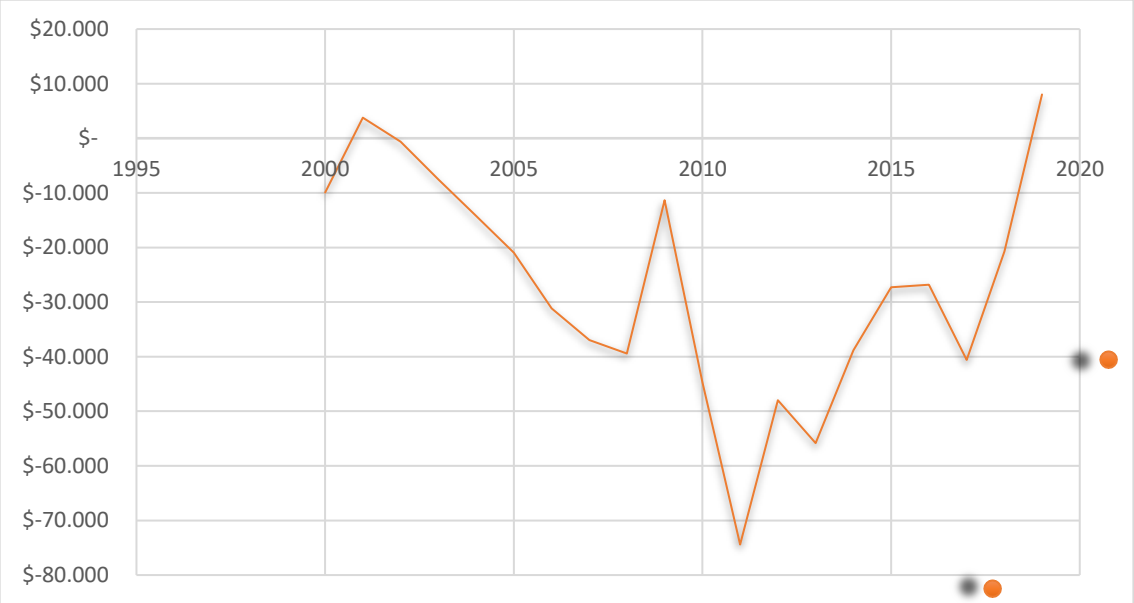


**Figure 5: Turkey's Current Account (2000-2019) $**

Central Bank of The Rebuplic of Turkey. [11.04.2020]. Ödemeler Dengesi İstatistikleri. https://www.tcmb.gov.tr/wps/wcm/connect/TR/TCMB+TR/Main+Menu/Istatistikler/Odemeler+Dengesi+ve+Ilgili+Istatistikler/Odemeler+Dengesi+Istatistikleri/

From 1995 to 2012, Turkey's manufactured good exports have shifted away from labor-intensive sector (Deger, Cagacan, 2014). Especially, the share of machinery and transportation exports are highlighted because of Turkey's export aims. The transformation of sectors stands out for all 2000s. Textile which was top export sector

until 2003, gave place to the automotive sector. After 2007, edible fruits and nuts, peel of melons or citrus fruits never took place within the top 10 export sectors in Turkey. Turkey's exports of manufactures were 9 billion dollars in 1990, 22 billion dollars in 2000 and 121 billion dollars in 2014 (Data is from WTO-International Trade Statistics 2015). Turkey's imports of manufactures were 14 billion dollars in 1990, 38 billion dollars in 2000 and 144 billion dollars in 2014. According to WTO data, capital-intensive sectors have a large share in Turkish Economy. As of 2019, top three export sectors respectively are automotive, machineries and mechanical appliances and iron-steel.

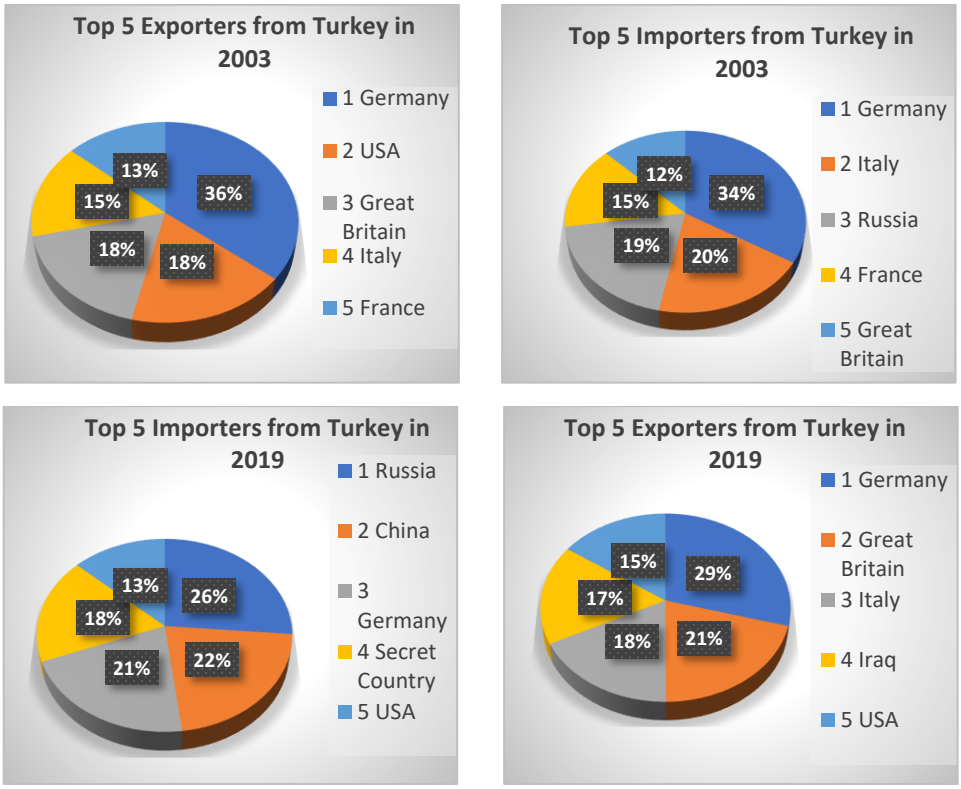


**Figure 6: Top 5 Exporters and Importers FromTurkey in 2003 and 2019**

Turkish Statistical Institute. [11.04.2020]. https://data.tuik.gov.tr/Kategori/GetKategori?p=dis-ticaret-104&dil=1

According to World Trade Statistical Review 2019, Turkey ranks 31st among 50 exporter countries and ranking of Turkey among 50 importer countries is 25th. Top 4 countries are China, United States, Germany, and Japan, which does not change both exports and imports. United States has just traded deficit top 4 countries in 2018. Comparing as a sectoral perspective, European Union, China, The United States and Japan are top 4 exporters and importers of manufacturers in 2018. Turkey does not rank among the top ten exporters manufacturers. Turkey is 9th rank with 26 billion dollars export in

automotive sectors. As the same rank, Turkey's import value is 17 billion dollars. When considered from this point of view, Turkey does not get the best of foreign trade. Because the increasing import content of export creates less value-added and current account deficit. Even, the cost of imported inputs can be transferred consumers via inflation.

Which sectors did become prominent in Turkey? It has been benefitted from RCA value so as to answer this question. Thus, it is used with the purpose of ranking of sectors. Turkey had a competitive advantage textiles and clothing (6,18), minerals (3,29) and vegetable (2,73) sectors in 2001. In 2010, Turkey coincided with the same picture. Textile was in the first rank (5,53), minerals were in the second rank (2,18) and vegetable was in the third rank (1,85). This rank changed as of 2018. Textile had a first rank (5,01), metals had a second rank (1,85) and the third one was transportation (1,83). RCA index analysis result shone out 47 products in 200 products. When an export value of 47 products in the share of Turkey's total export was 31,4%, the share of 47 products in 285 products was determined as 57,9%. At the same time, 285 products had a high demand in international markets (TİM). The products which increased global import, had high RCA value.

Based on WTO, Turkey does not use much more imported intermediate inputs like developed countries. Whereas, developed countries release high value-added goods to the market, Turkey is not producing high added-value goods enough to compete other countries. Above it has mentioned above, Turkey shifted its production from labor-intensive commodity to capital-intensive commodity. On the other hand, Turkey did not complete as much industrialization process as developed countries could. This situation boosted import dependence.

Competition has become hard via globalization in some sectors. Textile is an example. Competition was provided in textile sector together with the abolition of the textile import quotas on 1 January 2005. After the accession of emerging countries to the market, imported inputs gradually increased in textile so that RCA of textile in Turkey fell behind. Textile failed regarding fashion creation. Therefore, textile has given place to motor land vehicle and machinery sectors after 2004. Motor land vehicle sector is a top sector for foreign trade of Turkey. However, the production of motor vehicle runs via fragmentation of production in Turkey. Assembling industry takes part of production in automotive sectors.

## 3. A GENERAL OUTLOOK ON THE TURKISH AUTOMOTIVE SECTOR AND ITS FOREIGN TRADE

Automotive sector, which is in connection with chemical, textile, electric-electronic and others by Figure 7, occupies an important position as a locomotive industry due to the fact that automotive industry brings new employment areas, the requirement of qualified and unqualified employees, sub-industries. Automotive industry, which provides direct and indirect employment opportunities, has a significant influence on Turkish Economy.

The share of automotive industry employment in the total manufacturing employment was 5,68% in 2015, 6,08% in 2016 and 5,02% in 2017 (Employment shares was taken from an Automotive Industry Report of Republic of Turkey The Ministry of Industry and Technology (2019). An increase one-person employment in automotive industry creates an increase five-person employment in other industries (Polat, 2020).

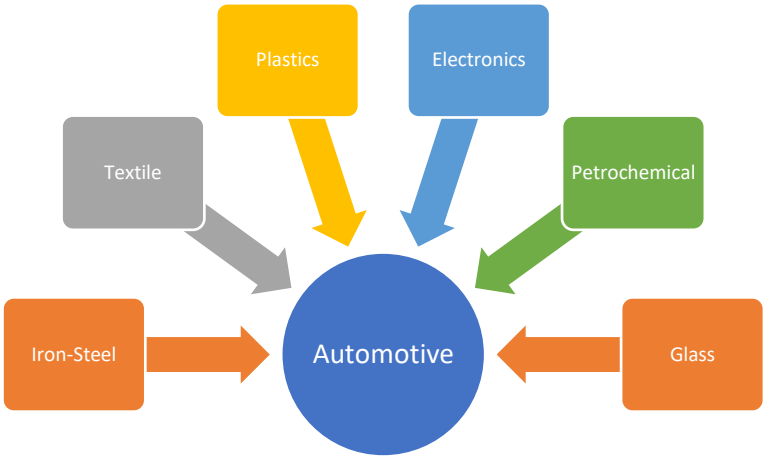


**Figure 7: The Relationship of Automotive Sector with Other Sectors**

Automotive industry, which plays a large role in the industrialization of the country contributes, employment areas, supply chain and evolvement of productivity.

Turkey's automotive parts and components sector grew simultaneous with the automotive manufacturing sector. The significance of auto industry came into prominence establishment of the republic of Turkey. Dating back to the 1920s, automotive sector was considered at

least as much as agriculture and manufacturing industry. This sector represents the modern Turkish Economy at the same time.

This sector has won the competitive advantages thanks to investments of FDI and multi-national automotive companies. The adventure of automotive industry reaches until 1929 thanks to Koç Holding and Ford. After this attempt, Anadol was created undersigned Ford by Koç Holding. In 1960s, most of companies started to bring into the market. Such as, Fiat, Renault. Those days, automotive industry tended internal demand because of import substitution policy. Major overseas expansion arose with the Customs Union Agreement in 1995. After this evolvement, Turkish auto industry achieved rapid growth. Since then, foreign companies have broken into the Turkish market other than Ford. The reasons of Turkey's attraction are that Turkey stays on an important geographical position and growing population. The number of producing cars and market share have increased more and more within years. Correspondingly, productiveness, technology and public support are vital in order to increase export and value-added so that this study is analyzed how the industry has a corner on the Turkish economy and discussed in detail whether automotive industry provides less contribution. Because of this, this study is benefitted from export and import statistics that are based on UN Comtrade data to exhibit whether automotive sector is a key sector in Turkey, whose value-added is high in the economy. The aim of thesis proves that whether the automotive sector creates positive value-added or not with the collected data. The automotive sector has a large role in Turkish economy so that it has been decided to progress in this sector. After 1980s, this sector made rapid progress and it preceded textile as of 2004. To be honest, motor land vehicles have been so popular almost all developing countries that have established assembling industry due to market and production potentialities. Turkey has also become foreign automotive brands of attraction.

**Table 1: Turkey of Top Three Export Sector**

| 2004 | | | | |
|---|---|---|---|---|
| **Rank** | **Code** | **Product Class** | **Total Export** | **Total Import** |
| 1 | 87 | Motor land vehicles, traktors, bicycles, motor cycles and other motor land vehicles, their parts and components | $ 8.288.798,57 | $ 10.237.023,93 |
| 2 | 61 | Knitted wear | $ 6.259.221,87 | $ 224.453,76 |
| 3 | 72 | Iron and steel | $ 6.259.221,87 | $ 8.031.521,81 |

UN-Comtrade. [25.02.2020]. https://comtrade.un.org/data

In this study, it has been focused on the several decrease in production looking at the below figure. There were three breakages between 1990s and 2000s in the automotive industry.

1. 1994 crisis and Customs Union Agreement with EU.
2. 2001 crisis
3. Global Crisis (2008)

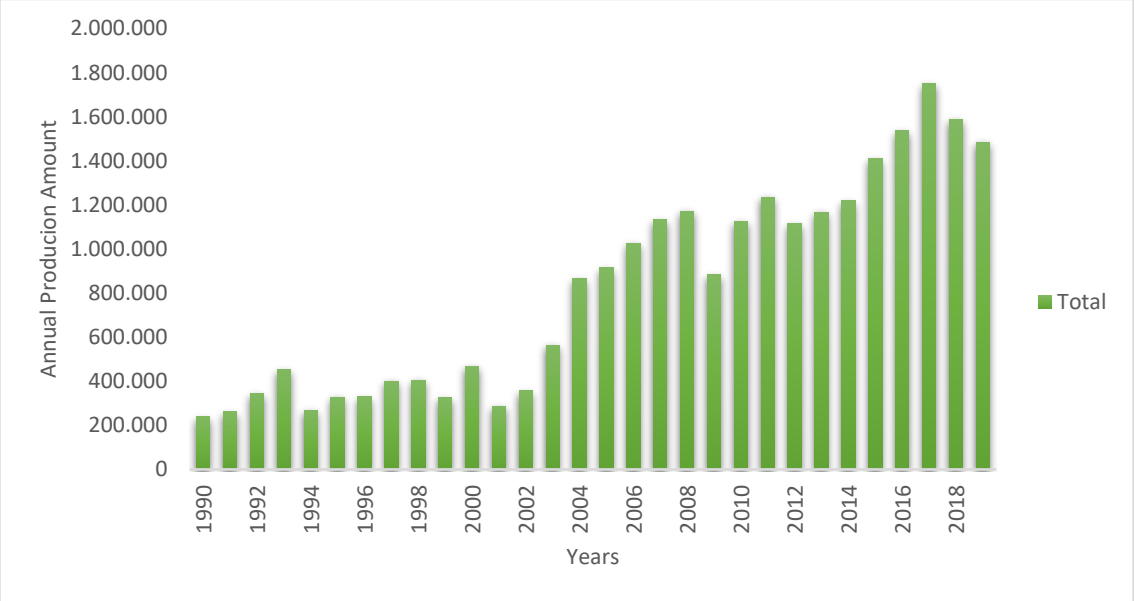


**Figure 8 :The Total Production Units of The Automotive Manufacturers**

International Organization of Motor Vehicle Manufacturers (OICA). Production Statistics. [11.04.2020]. https://www.oica.net/production-statistics/

Starting the first breakage, 1994 crisis affected the production adversely, that's why production decreased by 41% in the Turkish Automotive Industry. In addition to the 1994 crisis, Customs Union Agreement with Europe Union came to an end final stage. This agreement contains in pros and cons. It is important to emphasize that either export or import increased thanks to the European Customs Union. Before the effects of the 1994 crisis finished, the Customs Union Agreement was signed. Taxes was zeroized to Europe of origin products. An excessive increase in import of automotive sectors has not anticipated. However, demand for imported vehicles fell down by 72% due to 1994 crisis. After the crisis, demand coverage ratio of imported vehicles increased year by year. It was at 15% in 1994 and 52% in 2000 (İstanbul Chamber of Industry, Otomotiv Sanayi Sektörü, 2002). Capacity usage gradually has diminished, and it changed from 77% in 1994 to 36% in 2000. An important increase in automotive industry experienced in 1999. But, 2001 crisis and economic imbalance did not allow to continue this evolvement.

When the second breakage examined, depending on the 2001 crisis, demand decreased. Because of knock-on effect, production also fell by 39%. Capacity usage went back to 29% in 2001. Shrinking domestic demand has led to an increase outward production tendency. Therefore, export of automotive sector went up 48% in 2001. Although an increase in exchange rate rose the number of imported vehicles, import of the sector reduced 66% compared to the last year. Automotive sector created negative value-added in Turkish Economy until 2001. This effect which reversed with the effect of the 2001 crisis, increasingly has been going since 2006. The automotive sector was the top export sector after 2003. Thus, created value-added is stood out.

As it was in many countries, Global crisis hits Turkey in 2008-2009 years. Real sector was influenced negatively. It caused unemployment, credit crunch, less capacity usage, and less output. Whenever crises hit the country, special consumption tax break is implemented by the government. In those years special consumption tax (ÖTV) was reduced. Capacity usage was 57% and it was less 19% compared to the previous year. For this reason, production decreased by 25% in 2009. Both of export and import decreased in 2009. A fall in export of automotive industry was 33% and the import of automotive sector decreased 30% in 2009 by Figure 8.

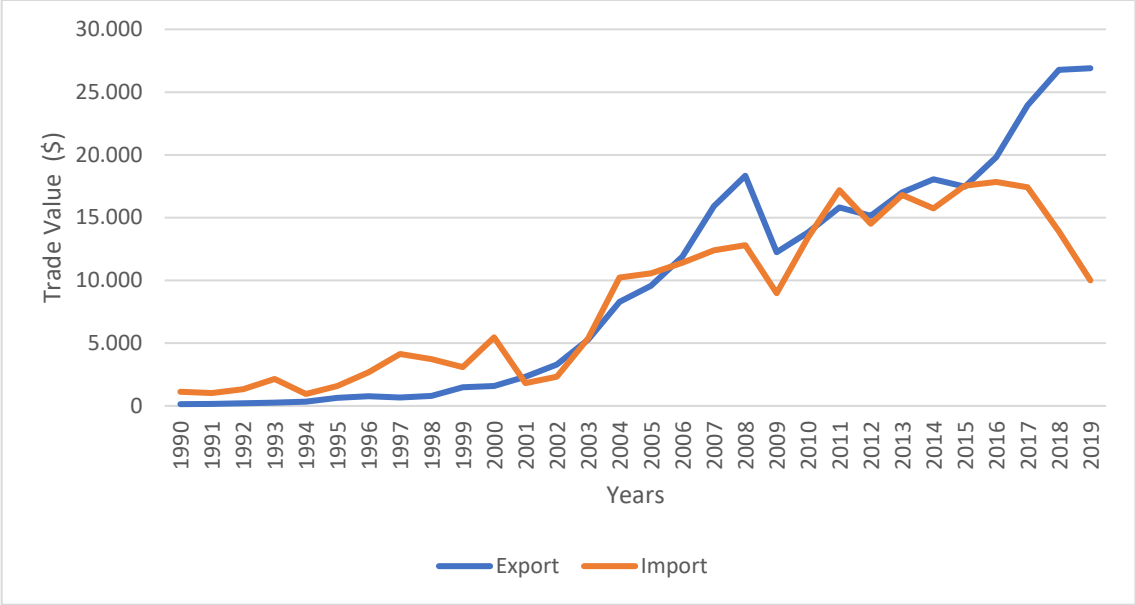


**Figure 9: Foreign Trade of Turkish Automotive Industry million ($)**

International Trade Statistics Database (UN-Comtrade). [25.02.2020]. https://comtrade.un.org/data

By and large, all of crises cause productivity slowdown in the automotive industry. Low demand accompanies less capacity usage.

The foreign trade statistics demonstrate that international copartnership brings Turkish automotive sector in competitive power. EU countries, predominantly have been overtowering in market share of export since the Customs Union Agreement. The automotive sector has faced to new evolvements via new Technologies, merger, and acquisition recently.

85% of the export of key industry and sub industry is supplied by Germany, Japan, USA, France, Belgium, Spain, South Korea, Great Britain, Italy, China, Canada and Sweden (Enterprise Europe Network, Otomotiv Sektör Raporu, 2009).

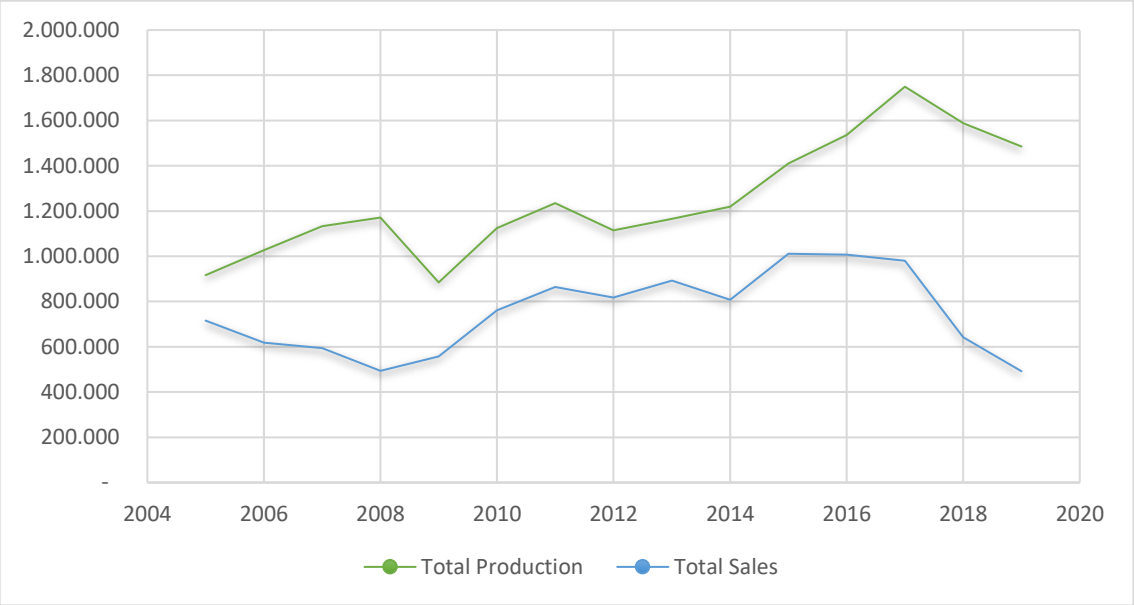


**Figure 10: Total Sales & Production in Automotive Sector**

International Organization of Motor Vehicle Manufacturers (OICA). Production Statistics. [11.04.2020]. https://www.oica.net/production-statistics/

The Figure 10 indicates total sales and production of the automotive industry in Turkey between 2005 and 2019. The diagram shows that total sales deteriorated in 2008 and total sales dropped 16,88%. However, production reacted a year from 2008. After 2016, total sales steadily declined. Concordantly, production has fallen into a decline since 2017. Although total automotive sales dropped in 2014, automotive production did not decrease. As the export of motor land vehicles rose by 6,25% owing to climbing in dollar bordering on 2,19. We can make an inference about 2017, 2018 and 2019. Indeed, there is an abnormal downtrend in these years. The dollar has been increasing without slowing down so Turkish lira also has been depreciating vis-a-vis foreign currencies. The dollar is the most influencing factor macroeconomic indicators. It is found a significant correlation between depreciation in TL and foreign trade thanks to increase in dollar export rose and import fell down. Another macroeconomic indicator is that Turkish industrial production index shows us decrease by 8,14% from 2017 to 2019 in manufacture of motor land vehicles (Data is given from TUIK). There is one positive progress in motor vehicles sector. According to TCMB, weighted average interest which is implemented vehicle loans that 16,13% in 2017, 31,93% in 2018, 20,80% in 2019 and

17,95% in 2020. If we consider all of these factors, the Turkish motor land vehicle sector faced with a fall in total sales and production within 2017-2019 years.

The automotive sub-industry creates a positive impression for Turkish Economy due to the fact that motor vehicles which are produced, are exported. We can involve below good to automotive sub-industries.

1. Engine and engine parts
2. Braking system and parts
3. Hydraulic and pneumatic parts and components
4. Suspension parts
5. Safety parts and components
6. Rubber and tyre parts
7. Frame parts and components
8. Electrical equipments and lighting systems
9. Metal casting parts
10. Accumulator
11. Automotive glass
12. Automotive seat

Automotive sub-industries make progress with automotive industry at the same time, but the sub-industry needs sustainable investment and technological innovation. Therefore, innovation in the sub-industry reflects automotive industry.

Import of automotive sub-industry started to increase allied with Customs Union membership. An other factor is that automotive firms do not prefer domestic parts and components to others.Imported parts and components consistently increases under these circumstances, essentially, engine and piston engine, tyres, parts that require software and technical knowledge, are much more imported in Turkey.

# 4. LITERATURE

Many articles are found on foreign trade of Turkish Economy. However, there are restricted articles that concentrate the usage of imported inputs. Particularly, sectoral analysis studies are relevant with automotive sector that are scarcely any. It has been mentioned about some empirical studies. If necessary, to explain why It has been decided this field, the answer to the question is hidden in this part. When the articles published in the academic field were examined, it was noticed that they were not included in recent date. In other words, some works have lost their actuality.

Saygılı et. al (2010) have tried to learn “why firms choose imported inputs in production of final goods.” This study was started for the purpose of determining used imported inputs in the manufacturing industry by the Central Bank of The Turkish Republic beginning of the 2008. They carried interview and survey method out selected 145 firms. The most crucial increasing import dependency driver is lack of domestic input production, poor quality domestic inputs, high priced inputs. In addition, there are two key words to explain the increasing import dependence on countries. First, countries which produce low-cost goods, started to put on the market their goods. China and India force the market with their low-priced goods. Second, competition and potential return increased thanks to globalization so that vertical specialization occurred in the shaped of FDI and imported intermediate goods.

Kundak and Aydoğuş (2017) have used panel data analysis method concernant sub-sector of the manufacturing industry of Turkey for between 1996-2011 years. When import dependence rate variable was used as a dependent variable, fixed capital investment, wage, GDP, exchange rate and wages were independent variables. This model has given the best result. There are several drivers which affects import dependence. An increase in the rate of import dependence causes imported intermediate and investment goods to increase so that import takes more share from production. Moreover, exchange rate has a voice in import dependence. The prices of imported

intermediate and investment goods increase in case of increasing exchange rate, so imported inputs are less preferable. An another driver is that when economies focus on growth, the usage of imported inputs correspondingly increases. Therefore, the share of value-added decreases. Fixed capital investments also affect import dependence. Because high interest rate provides the production of less domestic goods. Finally, increasing wages cause costs to increase so that imported inputs can be decreased. A rise in imported inputs has been observed in paper and paper goods printing industry, chemical, petrol, coal, rubber, plastic goods industry, metal articles, machine and means of transport.

İnançlı and Konak (2011) have searched on the reasons of dependence in foreign trade. These are the main ones:

1. The evolvement in exchange rate and Overvaluation of National Currency: When a national currency is overvalued, it decreases the price of imported goods in terms of national currency.
2. Inconsistent Economic Structure:
3. Poor Private Sector Investments: Because of lack of domestic savings, private sector investments are at the lowest level that is why import independence is emboldened.
4. Energy Costs: Developing countries are foreign-dependent respecting energy and yet production and current account deficit are affected by energy costs.
5. The Connected Structure of One Market and One Product of Export: Limited production also contributes increasing import dependence
6. The Related Evolvements of The Interest Rates: At the same time high inflation and interest rate affect adversely.

They have figured direct backward and forward linkages out and the share of total vertical specialization was found based on an inverse export matrix and export vector. They used TUIK's 1998 – 2002 input & output tables. They paid attention 2003 and 2010 period. As 1980, Turkey concentrated automotive sector. In the meantime, import of intermediate goods and capital gradually increased. As parts and components of automotive sector was producing in Turkey, these mostly were providing from parent company in the late 1990s. Therefore, value-added gradually decreased.

Cuihong and Jiansuo (2007) analyzed the ratio of foreign trade dependence of China after 2001 that increased year by year. They referred vertical specialization in two ways (VS share and VS value). Although China's export rose, intermediate and row material, accessory, components were imported after 2001. They studied China's import dependence on the basis of input-output table and vertical specialization. According to the computation, capital-intensive commodities had more the ratio of imported intermediate goods. The ratio of imported dependence was so high in high-tech enterprises. Domestic accessories and components were used very little in the economy due to poor quality, tax policies and competitive environment. Telecommunication equipment sector export had very high the ratio of import dependence, petrol processing had the second highest the ratio of import dependence. 7 of 16 sector was above the average.

Erkök (2018) discusses automotive sector, which is the high the share of foreign capital firms. Besides, it is a locomotive position in export of Turkey. Most of multi-national companies have started to be active owing to cost advantages. Such as, tax break and cheap labor. The automotive sector has become global value chains. This study has been benefitted from 2002 input-output table of Turkey so as to reveal import dependence of the automotive sector. The most crucial result was that automotive sector created large production capacity. However, augmentation of production was accompanied by an increase of imports. This study has been proved that automotive sector uses 25% imported commodities for one unit production. In other words, 25% of used inputs was supplied via import. It has been studied that automotive sector, which was used as inputs and inputs which were used for automotive production.

Türkan E. (2006) analyzes that import dependence of production in manufacturing industry. Import and export dependence of 170 firms were calculated that were in the manufacturing sector for 2003-2005 periods. In addition, it has been benefitted from firms' data. The share of import in cost and share of export in sales was reached. It has been exhibited that general import-cost ratio was 62,3% and energy dependence has been increasing year by year. The highest ratio of import and production stood out communication, metal, automotive, plastic sectors. The ratio of import and total supply showed parallelism with the ratio of import-production. The ratio of export-total supply demonstrated that how much a country needs foreign demand for total supply that generates from import. The highest ratio of import and cost occurred in energy, base

metal, white appliances and chemical sectors. As for the lowest ratio of import and cost food, cement-ceramic, printing sector have glittered. The ratio of export and production and the ratio of export and import. This ratio was 21,8%. Another indicator was the ratio of export-import. According to this ratio, increase of import dependence was observed. To the study way of thinking, textile sector left a positive impression on foreign trade balance. The ratio of export-sales was 42,2% throughout of the manufacturing sector. Export dependence remarked let-up and decline. This study determined that domestic demand was more significant rather than export for manufacturing sector.

Erduman, Eren, Gül (2019) highlight in their studies that globalization and global value chains affects used imported goods. Imported contents of production and export is analyzed for 2002 and 2017 period. Commodity flow accelerates thanks to globalization. Turkey brings FDI to multinational firms notice and vertical specialization also augments import dependence. It has been used input-output tables, commercial statistics and direct and indirect import requirement ratios. The sectors with the highest import requirements are found to be those with higher capital and technology intensity, such as coke and refined petroleum products, basic metals and motor vehicles. Growth rate and production values are calculated as to 2002 and 2012 IOT. The findings prove that import content is in uptrend in 10 of 20 sectors. Whichever sector has more import dependence, becomes more import dependence. It is determined that when a firm start to produce a new goods, the firm must more import. Domestic intermediate goods do not substitute for import intermediate goods in plastic and rubber, computer and electronic products sector and Turkey concentrate that whichever sector uses more import contents, is exported. As an extra information, production has less import dependence than exports.

## 5. DATA AND METHODOLOGY

This thesis is related to import dependence of Turkey in general. In respect to a special subject, it descends analysis of the automotive sector and its sub-industry. In fact, when I decide to choose this topic, Turkey's the most export sector is started out to analyze since automotive sector, which is the top exported sector, exposes the most value-added. However, all countries almost get involved in globalization and vertical specialization so that production and trade are impressed by this. To speak another factors, intra-industry trade and FDI bring import dependence out thanks to globalization. Therefore, the most exported sectors cannot be the most in reality. As used import intermediate goods and capital reduces the value-added. Starting from top export sector, It has been focused on Turkey's import dependence in automotive sector. Moreover, domestic automotive production has been taking an important place in agenda recently and 2023 export aims of Turkey are announced by TİM and state. Considering all of these advances, automotive sector must be analyzed in Turkey economy as well as World economies in the way of export, import, production and sale. This critical sector encourages development of another sector. In other words, automotive sector creates new employment opportunities. Sub-industry and sectors of high backward linkage in the automotive sector are given example at this point.

The data has been collected from UN Comtrade, TUIK, TIM, OICA, OSD, ODD, UNIDO, Republic of Turkey Ministry of Trade and Republic of Turkey Central Bank to reveal automotive sector of pros and cons. Import and export value, the quantity of sales, production value requires to calculate IDR, vertical specialization, and intra-industry trade. Data comprises between 2000-2018 years. The data of the foreign trade part merely reaches out until 1980s.

## 5.1. Interdependence Ratio & Intra-industry Trade

Interdependence is measured by the costs of severing the relationship (or the benefits of developing it). The higher the costs to one country, the greater is the degree of dependence of that country (IMF, 2001). If both countries provide more advantages from interdependence, they do not want to sever this relationship. Because costs are on the carpet. A small country also provides more advantages thanks to interdependence. It is sayable that international interdependence is increasing at present and it reflects on international trade.

Well then, how was this notion used? It has been computed getting out of import, export, and production value. Export and import value data were obtained from UN Comtrade. After that, Production value was necessary in order to complete the computation. I could find production value in only a database. United Nations Industrial Development Organization (UNIDO) gave a chance to me so as to combine data. Output in terms of USD currency was chosen on UNIDO. Just one thing created a difference on data. Import and export values were in terms of the Harmonized System, but production value was in terms of ISIC revision 3. Therefore, two code systems might be compared. Which codes included whatever, they approximately have been expressing the same things.

Interdependence ratio is stated one way:

$$\mathrm{IDR} = \frac{\sum \mathrm{M}}{\sum \mathrm{P} + \sum \mathrm{M} - \sum \mathrm{X}} \times 100 \qquad (1)$$

where IDR is import dependency ratio and P is the production value, M is import and X is export.

This calculation shows us export value has been increasing nowadays. If the ratio dwindles, import dependence increases in the country.

Intra-industry trade means that trade in similar products (“horizontal trade”) with differentiated varieties (e.g. cars of a similar class and price range) or trade in “vertically differentiated” products distinguished by quality and price (e.g. exports of high-quality clothing and imports of lower-quality clothing).

Below is the intra-industry trade notation. Grubel-Lloyd approximation is adopted in this notation.

$$\mathrm{IIT} = 1 - \frac{\sum|\mathrm{X} - \mathrm{M}|}{\mathrm{X} + \mathrm{M}}$$

where IIT is intra-industry trade. (2)

External deficit and surplus are ignored. The index remains one of the 0 and 1. If a country just exports or imports for one commodity, the index is equal to 0. If export equals to import, the index is 1. The index enables to compare between countries. Intra-industry trade increases as long as the index approaches to 1.

## 5.2. Vertical Specialization

According to Hummels, Ishii and Yi (1999), the key idea of verticality in trade is that to produce a final good, countries link sequentially. Their ideas focus on three conditions that involve below:

I. A good is produced in two or more sequential stages,

II. Two or more countries provide value-added during the production of the good,

III. At least one country must use imported inputs in its stage of the production process, and some of the resulting output must be exported.

They have used as a source of input-output tables, which provides industry level data. Data demonstrates that small countries tend to be more vertically specialized than large countries. They also find that imported inputs go up more rapidly in export-oriented sectors.

While all countries have specialized at least one in a production stage of goods, international trade has dramatically increased after 1980. Hence, production process includes intermediate goods of different countries in export goods accompanied by growing foreign trade, so final goods refer more than one country with contents and it is exported. In other words, using imported inputs are transformed final goods.

Turkey complies with vertical specialization like other countries in the world. Vertical specialization has a significant share in foreign trade due to augmentation of intra-industry trade. Production shifts countries which produce lower cost goods. Furthermore, an increasing in intra-industry trade is possible within the country. Some sectors have

established thanks to foreign partnerships. Such as, automotive sector. Turkey exports motor vehicles, but some parts and components come from foreign countries. Such as; engine, software programmes, batteries. Accordingly, intra-industry trade increases between countries. Thus, production expands different countries. More than one country acts a part in order to produce a final product these days.

It has been said about that how VS values for the Turkish automotive sector were found in this part. It has been mentioned earlier that why the automotive industry chose. The automotive sector is a key factor in Turkey's economy. The automotive sector is the most strategic sector, that creates value, and it is top export sector in Turkey. Before VS of automotive sector have been calculated in Turkey, the amount of imported motor vehicle inputs and the amount of exports of motor vehicles have been collected from UN Comtrade in terms of import and export quantity for 2000s. The amount of domestic sales of motor vehicles was obtained from OSD earlier.

The measure of vertical specialization (VS) is given as below.

$$\mathrm{VS} = (\mathrm{A}/(\mathrm{D} + \mathrm{E}))^{*}\mathrm{E} \tag{3}$$

where VS is vertical specialization, A is the amount of imported motor vehicle inputs, D is the amount of Turkey's sales of motor vehicles and E is the amount of exports of motor vehicles to all countries. Increasing VS share expresses that the fragmentation of exports of motor vehicles to the world is increasing. This value has been decreasing in Turkey slowly after the global crisis.

## 6. EMPIRICAL ANALYSIS

Automotive sector stands out amongst other industries in Turkey with respect to export, import and employment. Most of foreign automotive brands export their automobiles by the way of Turkey and they set up their production plants in Turkey.

The automotive sector is a major sector in Turkey. We can find out this from the share of automotive industries within Turkey's total export and import. Looking Table 2, the share of the automotive sector's export has been increasing over the years. The automotive sector has been top export sector since 2003 by Appendix A so increasing the share of automotive industries within Turkey's total export is an inevitable result after 2003. As it is seen in Table 2, the share of the automotive sector's export within Turkey's total export is near between 11% and 14%. But this percentage was almost %16 in 2018. There is not a noticeable change in the share of the automotive sector's import within Turkey's total import except for 2004, 2005 and 2016. Thus, no matter what happens, Turkey is obligated to import inputs, intermediate goods, capital goods to produce final goods and Turkey needs imported inputs so as to export them. We can draw a conclusion Turkey import dependence from Table 2. Because import does not react global and local events. For example, the exchange rate has been increasing in recent years. However, the share of the automotive sector's import within Turkey's total import is around approximately 6% and 9%.

Turkey finds favorable using imported inputs due to quality and cost advantages. Turkey also imports intermediate goods and capital goods to manufacture final goods. After that, final goods which are produced in Turkey, is exported so vertical specialization is completed simply. As it is seen in the figure 12, vertical specialization of in the automotive sector is decreasing recently. Fall in imports has an effective role in decreasing vertical specialization. When the export of automotive sector is 1.402 billion dollars in 2019, import is 563 million dollars.

**Table 2: The Share of Automotive Sector within Total Export & Import**

| Years | The Share of Export of Automotive Sector in Total Export | The Share of Import of Automotive Sector in Total Import |
|---|---|---|
| 2000 | 5,68% | 10,00% |
| 2001 | 7,45% | 4,41% |
| 2002 | 9,12% | 4,52% |
| 2003 | 11,16% | 7,76% |
| 2004 | 13,12% | 10,50% |
| 2005 | 12,84% | 9,04% |
| 2006 | 13,90% | 8,17% |
| 2007 | 14,83% | 7,29% |
| 2008 | 13,88% | 6,33% |
| 2009 | 11,99% | 6,37% |
| 2010 | 12,13% | 7,23% |
| 2011 | 11,71% | 7,14% |
| 2012 | 9,94% | 6,14% |
| 2013 | 11,20% | 6,68% |
| 2014 | 11,46% | 6,50% |
| 2015 | 12,14% | 8,47% |
| 2016 | 13,89% | 8,98% |
| 2017 | 15,25% | 7,45% |
| 2018 | 15,94% | 6,23% |

Table 2 demonstrates that the share of the automotive sector's export in total export slowly rises over the years. Year 2004 is a transition year from knitted and crocheted goods sector to motor vehicle land sector in export so the share of the automotive sector's import in total export was high both of 2004 and 2005. Likewise, the share of import of the automotive sector in total import was high in 2004 and 2005. A rise in exchange rate remained low compared with an inflation rate in 2002. This case ensured increasing imports. In spite of economic condition in 2002, the share of the automotive sector's import in 2004 could be high in total import due to the fact that top export sector is automotive sector for the first time. Intermediate goods and raw materials are needed to export in motor land vehicle. Because the production of automotive sector must be sufficed both of domestic market and foreign market.

Meanwhile, the share of export of the automotive sector increased by 17,61% compared to the 2003, the share of imports of automotive sector increased 35,18%. Although the share of automotive sector's export in total export was 11,99% in 2009, the share of export of automotive sector in 2009 increased by 1,12% compared with 2008. The share of import in 2009 of automotive sector in total import increased by %6,37, but the share

of import just rose by 0,57% compared with 2008. Approaching recent times, the share of in 2018 automotive sector in export had the highest share and the share of in 2018 automotive sector's import in total import is 6,23% whereas, the share of the automotive sector's import decreased by 16,43%. Import of automotive industry did not decrease except for 2017 and 2018 years. As for determination, the share of export & import of automotive sector increased in the present case, but the share of the automotive industry's also increased compared to the previous year then, intra-industry trade had influence in this case. However, if both of the share of import of the automotive sector and the share import of the automotive sector compared to the previous year decreased, a fall in the automotive sector's import could be noticed.

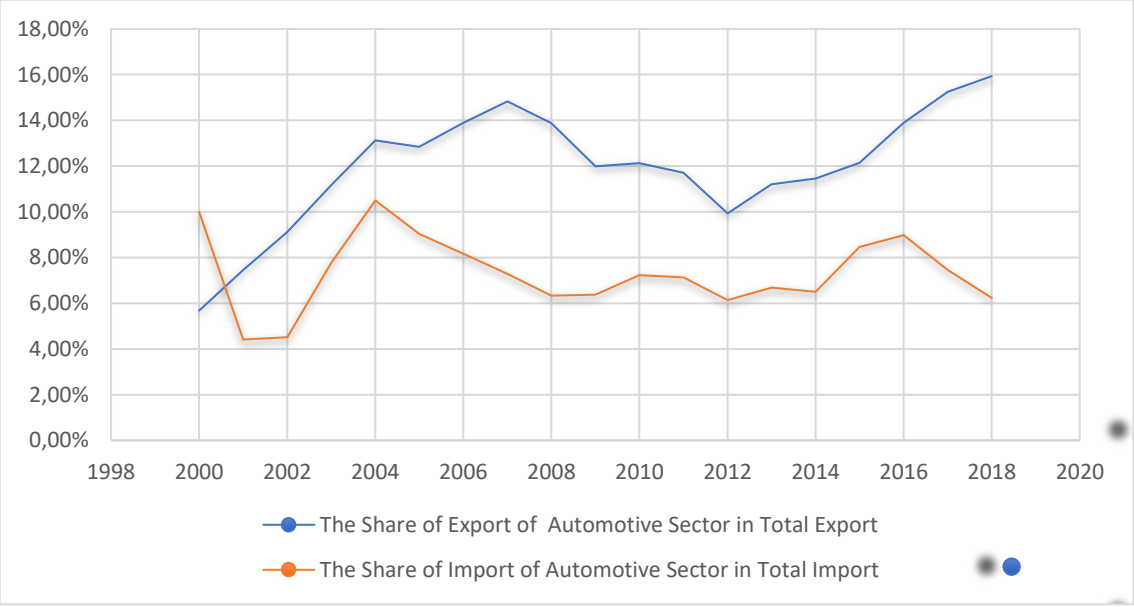


**Figure 11:The Share of Automotive Sector in Total Export & Import**

The share of in recent times export & import of the automotive sector in total export & import dramatically moves away from each other in figure 11. The figure 11 indicates that the share of import and export of automotive industry in total export and import have been increasing sharply since 2004.

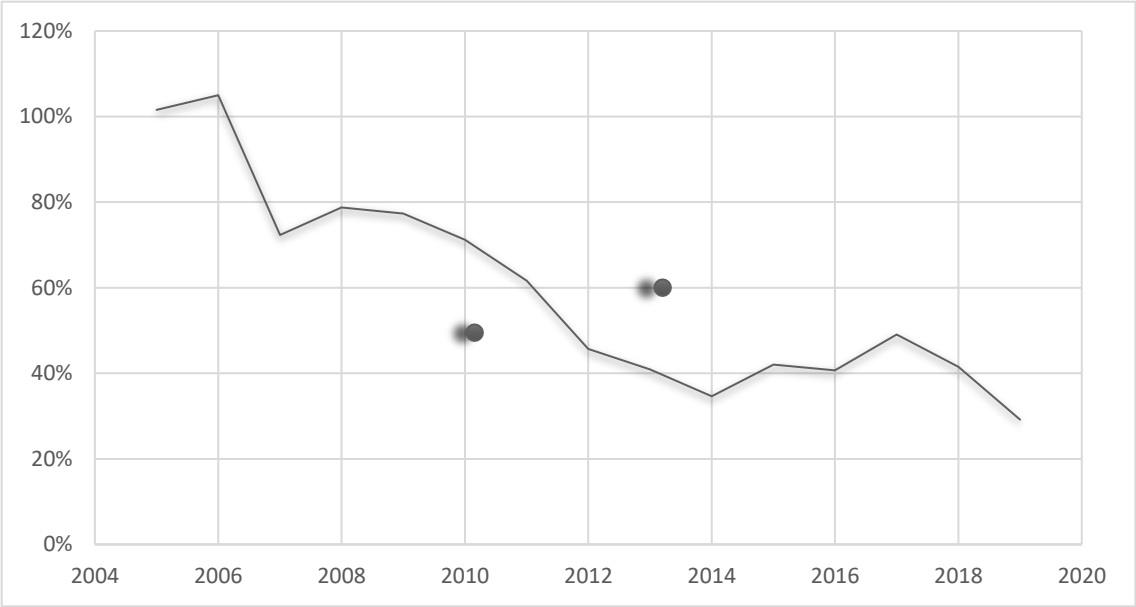


**Figure 12: Vertical Specialization of Turkey's Automotive Sector (amount of exports)**

Figure 13 shows the interdependence ratio of the automotive sector of Turkey that it is an increase trend nowadays. The increase trend is an expected case because of decreasing imports. Import of in 2017 automotive sector decreased by 2% and export of automotive sector increased by 21%. IDR was 53,30% in 2017. Whereas automotive industry's import fell by 20%, automotive industry's export in 2018 rose by 12% in 2018. IDR is 62,27%. As the import of automotive sector fell, IDR has been high recently. Even though, the automotive sector's import was higher than the automotive sector's export, IDR was 49,01% in 2004.

Vertical specialization has a significant share in foreign trade due to augmentation of intra-industry trade. Production shifts from a country to another countries, which produce lower cost goods. As I mentioned VS in part 5.2, the products, which must be produced in at least two countries, is exported later. Countries must use imported inputs in its stage of the production process. As regards Figure 12, vertical specialization is diminishing nowadays. The usage of imported input drops, and export of the automotive sector continues to rise after 2017. Thus, VS of the automotive sector is lower. Therefore, when export and import decreases, VS also drops. Motor land vehicles which are exported, involve less the imported content in exports after 2017. As for 2005 and 2006, VS is 102%

and 105% because of rising of the automotive industry to the top export. As a result, the usage of imported input is quite high in all exported products in these years.

**Table 3: Vertical Specialization of Turkey's Automotive Sector**

| Years | VS | VS/(amount of exports) |
|---|---|---|
| 2005 | 394.180.426,86 | 101,57% |
| 2006 | 476.403.066,41 | 104,99% |
| 2007 | 421.277.831,70 | 72,31% |
| 2008 | 457.062.653,06 | 78,75% |
| 2009 | 301.035.772,42 | 77,32% |
| 2010 | 394.119.455,47 | 71,17% |
| 2011 | 405.538.429,52 | 61,61% |
| 2012 | 320.933.523,05 | 45,67% |
| 2013 | 314.730.060,34 | 40,91% |
| 2014 | 292.225.399,58 | 34,63% |
| 2015 | 366.691.824,85 | 42,05% |
| 2016 | 359.979.443,27 | 40,72% |
| 2017 | 467.110.071,90 | 49,05% |
| 2018 | 418.812.974,44 | 41,53% |
| 2019 | 304.004.445,04 | 29,17% |

Intra-industry trade means that countries which export the same product or differentiated goods, also import them at the same time. This ratio demonstrates that if a country just exports or imports for one commodity, the index is equal to 0 and if export equals to import, the index is 1. Intra-industry trade increases as long as the index approaches to 1.

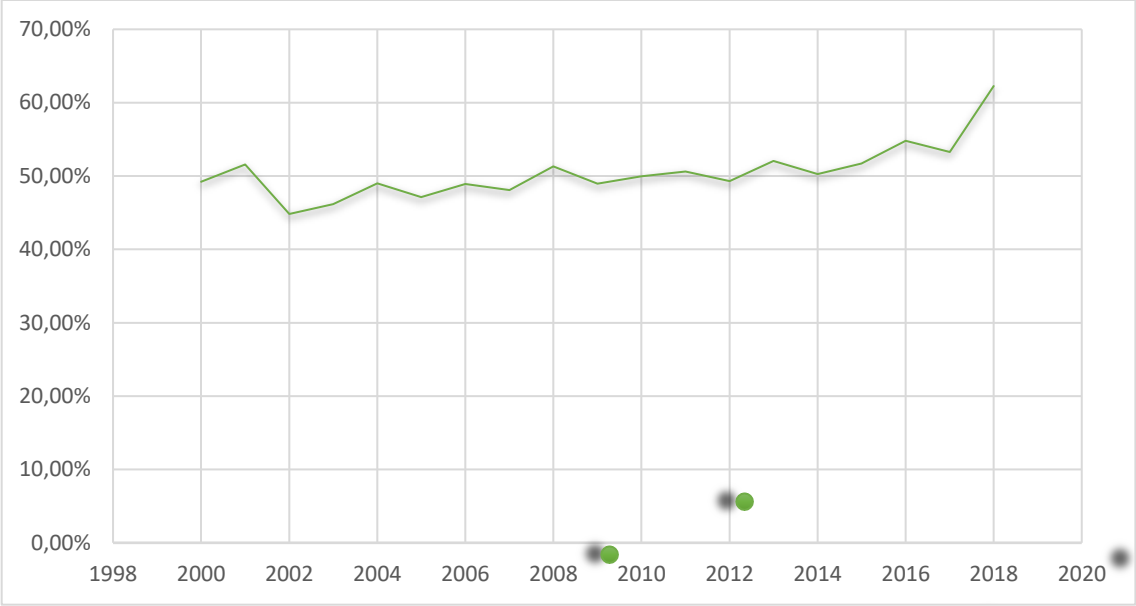


**Figure 13: Interdependence Ratio of Turkey's Automotive Sector**

According to Figure 14, intra-industry trade increases between 2001 and 2017 years. 2004 2000-2001, 2008-2009, 2014-2015 and 2018-2019 that are determined as problematic years above, have a high intra-industry trade except for 2018 and 2019. As exchange rate sharply rose, there has been still a depreciation on TL. Taking into consideration all these developments that import has sharply decreased since 2017. Domestic market shrinkage occurred after 2017. Export has been increasing so that intra-industry trade of the automotive sector is approaching zero. We can see that intra-industry trade has not dropped down below 0,8 level ever since 2001. However, intra-industry trade decreased as of 2017. This case indicates that the foreign trade of the automotive sector predominantly turns towards export.

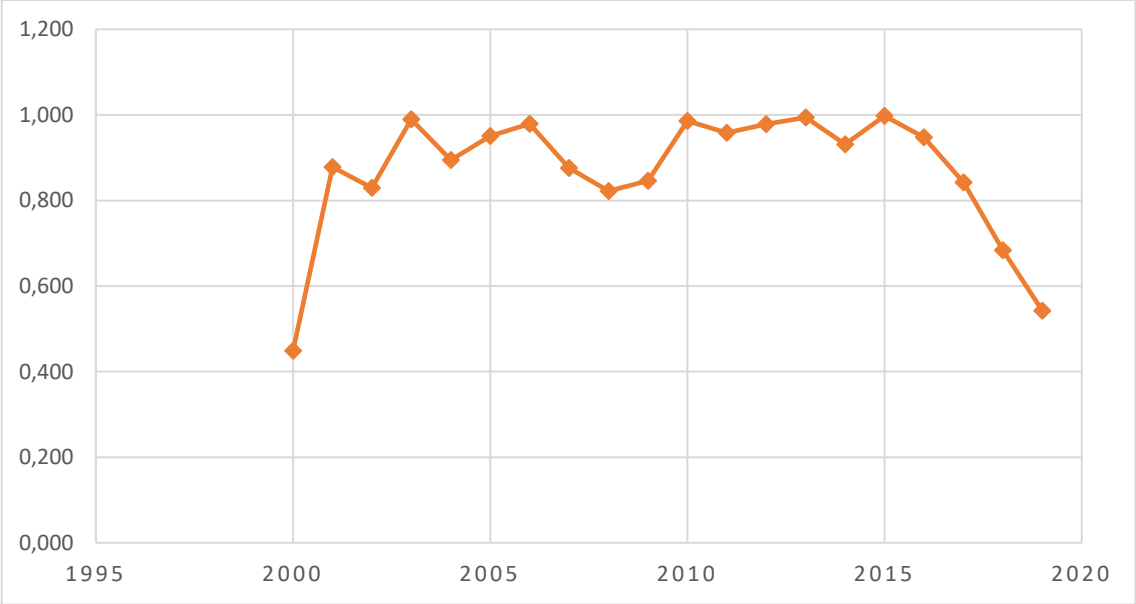


**Figure 14: Intra-industry Trade of Turkey's Automotive Sector**

Finally, appendix F, G and H show automotive sector's export, import and intra-industry trade in key industry and sub-industry with regard to Harmonized System Codes (HS). They are sorted in terms of import. Export, import and intra-industry trade were procured for all 2000s years. But 2004, 2011 and 2018 years were selected. Because automotive sector was top export sector in 2004. 2011 was selected due to being a year of post-global crisis and 2018 was an example for last period. HS codes were roughly included that were related to automotive industries. Intra-industry trade was conducted for all 2000s.

If codes are generalized, textile, glass, iron-steel, machinery, plastics, and vehicles are taken part in the tables in the automotive industry. Iron & steel, parts and accessories of vehicles, aluminium and internal combustion piston engines are the most imported inputs in the automotive industry.

## 7. CONCLUSION

Production shifts from developed country to developing countries together with globalization in regards to cost, labor and raw material. The automotive sector has been included global value chain is in these premises and increasing import dependency of automotive sector causes less value-added in the export. Moreover, Turkey continues to turn to capital-intensive commodities from labor-intensive commodities. Required substructure and technologies are deficient for tendency of capital-intensive commodities. This situation creates dependence in high tech sectors. In addition, foreign companies which show interest to developing countries, start to be active. Reasons like cost, quality and lack of domestic inputs increase import dependence in the country so that value-added of export is decreasing. Global value chain, vertical specialization, intra-industry trade is also gotten a new grip on our lives and interdependence attendantly occurs.

The automotive sector has been an enhanced sector in Turkey since 2004. The automotive sector is the most efficient sector on foreign trade because of being top export sector. If export is wanted to increase in the automotive sector, Turkey needs more imported inputs so that using imported inputs creates less value-added, current deficit and balance of payments deficit. On the other hand, the production of the automotive sector is carried out via assembly industry and automotive companies are established as foreign partnership. Besides that, supply of sub-industry is insufficient. Such as, engine, software, electronic devices. Foreign automotive brands make imported inputs obligatory along the way production of automobiles. In addition, when Turkey more overgrows, increasing import emerges. As a result of these, import dependence is an inevitable ending for Turkey. The underlying problem is here that import dependence is promoted, new technologies are not invested, and sub-industries are not supported sufficiently. Global issues, interest rates, cost and exchange rates are also affected import dependence, but the policies of the governments and incentives can decrease import dependence.

Although Turkey's import has been decreasing recently, import dependence constitutes a problem in most of the studies. Studies present that a rise in import of Turkey has increased until 2017 and input-output tables reveal import dependence of Turkey. This thesis is parallel to some studies prove that import dependence is a trouble for Turkish export. Figure 9 is not opposed to this thesis due to being nonstationarity foreign trade of the automotive industry. When foreign trade of the automotive sector was stable until 2002, it spurted post-2002. Turkey experienced Exchange rate fluctuation, price volatility, national and global crises, external shocks, inflation pressure, slowdown in developing countries' demand that took an active role in foreign trade. Total sales of automotive have decreased, whereas the total production of the automotive sector has increasing until 2008. Both of export and import have increased by 2008. Export and import of automotive decreased in 2009. In response to this, total sales and production also decreased. The import was uphill and downhill until 2017. Total sales did not observable change, but total production was in increase trend until 2017. After 2017, Export & import of the Turkish Automotive sector has replied to economic issues, crises change of exchange rate and demands. Therefore, total sales, production and import of automotive have been decreasing recently. On the contrary, cyclical drivers, global value chain, multinational corporations spark import dependence.

Turkey's automotive industry is almost as old as the country itself. This industry is seen as a locomotive of economic. In addition, Turkey is one of the most important commercial vehicle producers in Europe. The reasons of Turkey's attraction are that Turkey stays on an important geographical position and growing population. The number of producing cars and market share have increased more and more within years. However, the automotive sector is exposed to pressures in terms of cost and competition. The reasons of augmentation of import are attendance of the Customs Union with the EU, a decrease in exchange rates, foreign demand, and costs. Producers have to use imported inputs and they have to accommodate global conditions so sub-industries of automotive industry should be integrated with global changes and R&D works should be supported. Turkey's domestic automobile brand (TOGG) is argumentative because of its design, inadequacy of infrastructure and foreign suppliers. There is no sufficient know how and infrastructure for electric vehicle in Turkey. Consequently, domestic automobile may not fully be domestic.

The automotive sector is a key determinant of production and Turkish real economy. Based on theory of comparative advantages, Turkey must progress to the production of low-tech commodities, but Turkey has transitioned from low-tech to middle-tech and high-tech. Turkey has been faced import dependence for years, so it must be reduced thanks to effective policies and regulations. Sub-industries should be encouraged, and sector should keep pace with new technologies and new skills. Inward processing regime, taxes and incentives should be enforced apparent under controls. Turkey must decrease the import dependence of the automotive sector, provided that value-added in the export is wanted to increase. An intermediate goods should be imported in a controlled manner, if there is a local production in the same intermediate goods. Sub-industries should cover the demand and quality should be adequate. The development of sub-industries is the most essential to raise value-added in export of automotive industry.

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# APPENDIX

## Appendix 1. Top Three Sectors of Turkey in Export (2000-2019) million ($)

| 2000 | | | | 2001 | | | |
|---|---|---|---|---|---|---|---|
| Rank | Sector | Export | Import | Rank | Sector | Export | Import |
| 1 | Knitted and crocheted goods and articles thereof | $ 372,86 | $ 11,19 | 1 | Knitted and crocheted goods and articles thereof | $ 364,12 | $ 8,37 |
| 2 | Non knitted and crocheted goods and articles thereof | $ 250,64 | $ 11,87 | 2 | Non knitted and crocheted goods and articles thereof | $ 263,94 | $ 11,31 |
| 3 | Electrical machinery and equipment, parts thereof | $ 197,77 | $ 611,31 | 3 | Vehicles other than railway or tramway rolling-stock, parts thereof | $ 233,54 | $ 182,71 |
| **2002** | | | | **2003** | | | |
| Rank | Sector | Export | Import | Rank | Sector | Export | Import |
| 1 | Knitted and crocheted goods and articles thereof | $ 444,30 | $ 9,07 | 1 | Knitted and crocheted goods and articles thereof | $ 573,26 | $ 14,05 |
| 2 | Vehicles other than railway or tramway rolling-stock, parts thereof | $ 330,41 | $ 233,27 | 2 | Vehicles other than railway or tramway rolling-stock, parts thereof | $ 527,20 | $ 538,34 |
| 3 | Non knitted and crocheted goods and articles thereof | $ 325,41 | $ 14,73 | 3 | Non knitted and crocheted goods and articles thereof | $ 381,39 | $ 23,01 |

| 2004 | | | | 2005 | | | |
|---|---|---|---|---|---|---|---|
| **Rank** | **Sector** | **Export** | **Import** | **Rank** | **Sector** | **Export** | **Import** |
| 1 | Vehicles other than railway or tramway rolling-stock, parts thereof | $ 828,88 | $ 1.023,70 | 1 | Vehicles other than railway or tramway rolling-stock, parts thereof | $ 956,64 | $ 1.055,28 |
| 2 | Knitted and crocheted goods and articles thereof | $ 625,92 | $ 22,45 | 2 | Knitted and crocheted goods and articles thereof | $ 659,04 | $ 25,27 |
| 3 | Iron and steel | $ 625,92 | $ 803,15 | 3 | Electrical machinery and equipment, parts thereof | $ 542,33 | $ 966,35 |
| **2006** | | | | **2007** | | | |
| **Rank** | **Sector** | **Export** | **Import** | **Rank** | **Sector** | **Export** | **Import** |
| 1 | Vehicles other than railway or tramway rolling-stock, parts thereof | $ 1.188,61 | $ 1.140,84 | 1 | Vehicles other than railway or tramway rolling-stock, parts thereof | $ 1.590,37 | $ 1.239,73 |
| 2 | Knitted and crocheted goods and articles thereof | $ 693,83 | $ 37,48 | 2 | Boilers, machineries and mechanical appliances, parts thereof | $ 878,13 | $ 2.257,04 |
| 3 | Boilers, machineries and mechanical appliances, parts thereof | $ 651,67 | $ 1.899,88 | 3 | Iron and steel | $ 837,23 | $ 1.618,24 |
| **2008** | | | | **2009** | | | |
| **Rank** | **Sector** | **Export** | **Import** | **Rank** | **Sector** | **Export** | **Import** |
| 1 | Vehicles other than railway or tramway rolling-stock, parts thereof | $ 1.832,67 | $ 1.278,97 | 1 | Vehicles other than railway or tramway rolling-stock, parts thereof | $ 1.225,17 | $ 897,59 |

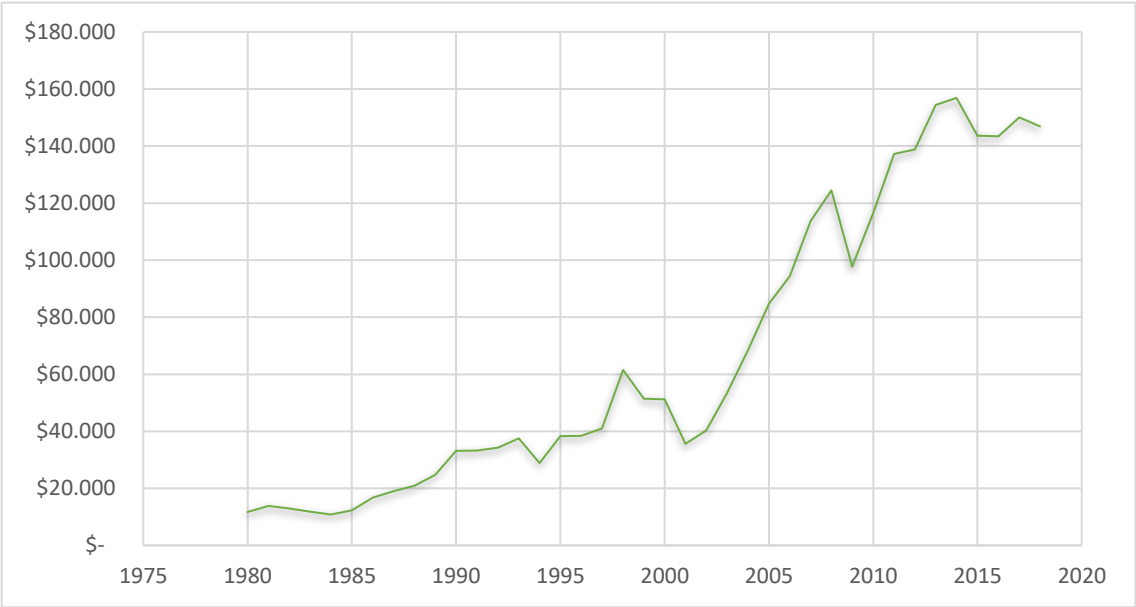
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2 | Iron and steel | $ 1.494,64 | $ 2.316,02 | 2 | Boilers, machineries and mechanical appliances, parts thereof | $ 813,28 | $ 1.713,20 |
| 3 | Boilers, machineries and mechanical appliances, parts thereof | $ 1.025,86 | $ 2.253,93 | 3 | Iron and steel | $ 764,10 | $ 1.135,16 |
| **2010** | | | | **2011** | | | |
| **Rank** | **Sector** | **Export** | **Import** | **Rank** | **Sector** | **Export** | **Import** |
| 1 | Vehicles other than railway or tramway rolling-stock, parts thereof | $ 1.381,27 | $ 1.341,94 | 1 | Vehicles other than railway or tramway rolling-stock, parts thereof | $ 1.580,34 | $ 1.718,41 |
| 2 | Boilers, machineries and mechanical appliances, parts thereof | $ 941,34 | $ 2.126,68 | 2 | Boilers, machineries and mechanical appliances, parts thereof | $ 1.156,10 | $ 2.711,07 |
| 3 | Iron and steel | $ 874,01 | $ 1.612,08 | 3 | Iron and steel | $ 1.122,53 | $ 2.042,42 |
| **2012** | | | | **2013** | | | |
| **Rank** | **Sector** | **Export** | **Import** | **Rank** | **Sector** | **Export** | **Import** |
| 1 | Precious stones, precious metals, pearls and articles thereof | $ 1.632,52 | $ 852,90 | 1 | Vehicles other than railway or tramway rolling-stock, parts thereof | $ 1.700,02 | $ 1.680,83 |
| 2 | Vehicles other than railway or tramway rolling-stock, parts thereof | $ 1.514,81 | $ 1.451,43 | 2 | Boilers, machineries and mechanical appliances, parts thereof | $ 1.298,92 | $ 3.015,67 |
| 3 | Boilers, machineries and mechanical appliances, parts thereof | $ 1.199,93 | $ 2.631,60 | 3 | Iron and steel | $ 991,88 | $ 1.869,09 |
| **2014** | | | | **2015** | | | |

| Rank | Sector | Export | Import | Rank | Sector | Export | Import |
|---|---|---|---|---|---|---|---|
| 1 | Vehicles other than railway or tramway rolling-stock, parts thereof | $ 1.806,34 | $ 1.573,59 | 1 | Vehicles other than railway or tramway rolling-stock, parts thereof | $ 1.746,26 | $ 1.754,36 |
| 2 | Boilers, machineries and mechanical appliances, parts thereof | $ 1.359,11 | $ 2.810,40 | 2 | Boilers, machineries and mechanical appliances, parts thereof | $ 1.233,31 | $ 2.558,67 |
| 3 | Knitted and crocheted goods and articles thereof | $ 1.002,42 | $ 98,50 | 3 | Precious stones, precious metals, pearls and articles thereof | $ 11.263.502,07 | $ 418,35 |
| **2016** | | | | **2017** | | | |
| **Rank** | **Sector** | **Export** | **Import** | **Rank** | **Sector** | **Export** | **Import** |
| 1 | Vehicles other than railway or tramway rolling-stock, parts thereof | $ 1.980,20 | $ 1.784,06 | 1 | Vehicles other than railway or tramway rolling-stock, parts thereof | $ 2.394,09 | $ 1.742,79 |
| 2 | Boilers, machineries and mechanical appliances, parts thereof | $ 1.233,92 | $ 2.729,69 | 2 | Boilers, machineries and mechanical appliances, parts thereof | $ 1.382,55 | $ 2.716,45 |
| 3 | Precious stones, precious metals, pearls and articles thereof | $ 1.217,64 | $ 720,44 | 3 | Precious stones, precious metals, pearls and articles thereof | $ 1.087,92 | $ 1.744,36 |
| **2018** | | | | **2019** | | | |
| **Rank** | **Sector** | **Export** | **Import** | **Rank** | **Sector** | **Export** | **Import** |
| 1 | Vehicles other than railway or tramway rolling-stock, parts thereof | $ 2.675,84 | $ 1.389,50 | 1 | Vehicles other than railway or tramway rolling-stock, parts thereof | $ 2.617,52 | $ 963,88 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2 | Boilers, machineries and mechanical appliances, parts thereof | $ 1.582,77 | $ 2.577,01 | 2 | Boilers, machineries and mechanical appliances, parts thereof | $ 1.645,39 | $ 2.152,51 |
| 3 | Iron and steel | $ 1.154,64 | $ 1.840,15 | 3 | Iron and steel | $ 993,94 | $ 1.468,07 |

Turkish Statistical Institute. [11.04.2020]. https://data.tuik.gov.tr/Kategori/GetKategori?p=Dis Ticaret-104

**Appendix 2. Manufacturing Value-added of Turkey $ billion**




World Bank. [25.03.2020]. Manufacturing Value Added. https://data.worldbank.org/indicator/NV.IND.MANF.ZS?locations=TR

## Appendix 3. Turkey's Trade (%GDP)

| Years | Trade (% of GDP) | Years | Trade (% of GDP) |
|---|---|---|---|
| 1980 | 17% | 2000 | 42% |
| 1981 | 21% | 2001 | 49% |
| 1982 | 27% | 2002 | 47% |
| 1983 | 29% | 2003 | 46% |
| 1984 | 35% | 2004 | 48% |
| 1985 | 35% | 2005 | 45% |
| 1986 | 29% | 2006 | 48% |
| 1987 | 33% | 2007 | 47% |
| 1988 | 36% | 2008 | 50% |
| 1989 | 34% | 2009 | 46% |
| 1990 | 31% | 2010 | 46% |
| 1991 | 30% | 2011 | 53% |
| 1992 | 32% | 2012 | 52% |
| 1993 | 33% | 2013 | 50% |
| 1994 | 42% | 2014 | 51% |
| 1995 | 44% | 2015 | 49% |
| 1996 | 49% | 2016 | 47% |
| 1997 | 55% | 2017 | 54% |
| 1998 | 40% | 2018 | 60% |
| 1999 | 37% | | |

World Bank. [25.03.2020]. Manufacturing Value Added. https://data.worldbank.org/indicator/NE.TRD.GNFS.ZS?locations=TR

## Appendix 4. Revealed Comparative Advantage of Turkey (1990-2017)

| Years | Capital goods | Intermediate goods | Raw materials | Chemicals | Mach and Elec | Plastic or Rubber | Textiles and Clothing | Transportation |
|---|---|---|---|---|---|---|---|---|
| **1990** | 0,09 | 0,86 | 0,93 | 0,23 | 0,22 | 0,26 | 6,95 | 0,06 |
| **1991** | 0,1 | 0,92 | 1,38 | 0,28 | 0,23 | 0,26 | 6,23 | 0,08 |
| **1992** | 0,16 | 0,86 | 1,2 | 0,25 | 0,3 | 0,38 | 6,06 | 0,11 |
| **1993** | 0,14 | 1,06 | 1,2 | 0,22 | 0,22 | 0,38 | 5,85 | 0,1 |
| **1994** | 0,18 | 1,15 | 1,4 | 0,34 | 0,24 | 0,48 | 5,52 | 0,17 |
| **1995** | 0,21 | 1 | 1,29 | 0,31 | 0,28 | 0,56 | 6,01 | 0,29 |
| **1996** | 0,26 | 1 | 1,23 | 0,35 | 0,35 | 0,56 | 5,97 | 0,35 |
| **1997** | 0,28 | 1,1 | 1,16 | 0,37 | 0,36 | 0,67 | 5,9 | 0,34 |
| **1998** | 0,29 | 1,01 | 1,33 | 0,32 | 0,43 | 0,67 | 5,95 | 0,29 |
| **1999** | 0,3 | 1,02 | 1,19 | 0,33 | 0,38 | 0,7 | 6,22 | 0,52 |
| **2000** | 0,33 | 1,06 | 0,93 | 0,34 | 0,42 | 0,77 | 6,81 | 0,6 |
| **2001** | 0,37 | 1,08 | 0,9 | 0,3 | 0,44 | 0,8 | 6,18 | 0,69 |
| **2002** | 0,42 | 1,01 | 0,76 | 0,28 | 0,51 | 0,76 | 6,29 | 0,8 |
| **2003** | 0,48 | 0,97 | 0,62 | 0,27 | 0,53 | 0,81 | 6,27 | 1,04 |
| **2004** | 0,48 | 1,03 | 0,54 | 0,27 | 0,53 | 0,78 | 6 | 1,29 |
| **2005** | 0,54 | 1,01 | 0,51 | 0,28 | 0,58 | 0,84 | 6,06 | 1,46 |
| **2006** | 0,58 | 1,01 | 0,5 | 0,29 | 0,59 | 0,9 | 5,84 | 1,61 |
| **2007** | 0,63 | 1,04 | 0,66 | 0,27 | 0,57 | 0,94 | 5,67 | 1,64 |
| **2008** | 0,67 | 1,26 | 0,57 | 0,32 | 0,57 | 0,98 | 5,23 | 1,7 |
| **2009** | 0,62 | 1,08 | 0,7 | 0,33 | 0,57 | 1,02 | 5,17 | 1,69 |
| **2010** | 0,63 | 1,09 | 0,63 | 0,41 | 0,6 | 1,07 | 5,53 | 1,6 |
| **2011** | 0,72 | 1,12 | 0,51 | 0,42 | 0,68 | 1,17 | 5,52 | 1,65 |
| **2012** | 0,66 | 1,37 | 0,45 | 0,4 | 0,65 | 1,13 | 5,49 | 1,43 |
| **2013** | 0,72 | 1,13 | 0,63 | 0,44 | 0,67 | 1,18 | 5,51 | 1,58 |
| **2014** | 0,69 | 1,15 | 0,62 | 0,45 | 0,65 | 1,19 | 5,38 | 1,52 |
| **2015** | 0,64 | 1,19 | 0,69 | 0,4 | 0,58 | 1,12 | 4,81 | 1,47 |
| **2016** | 0,65 | 1,17 | 0,7 | 0,39 | 0,58 | 1,11 | 4,83 | 1,54 |
| **2017** | 0,64 | 1,16 | 0,63 | 0,41 | 0,57 | 1,13 | 4,94 | 1,77 |

World Bank.[11.04.2020]. Turkey Product Revealed comparative advantage to World. https://wits.worldbank.org/CountryProfile/en/Country/TUR/StartYear/1989/EndYear/2017/TradeFlow/Export/Indicator/RCA/Partner/WLD/Product/all-groups

## Appendix 5. Exports & Imports of Goods and Services (% of GDP)

| Years | Exports of goods and services (% of GDP) | Imports of goods and services (% of GDP) | Years | Exports of goods and services (% of GDP) | Imports of goods and services (% of GDP) |
|---|---|---|---|---|---|
| 1980 | 5% | 12% | 2000 | 19% | 23% |
| 1981 | 8% | 13% | 2001 | 27% | 23% |
| 1982 | 12% | 15% | 2002 | 24% | 23% |
| 1983 | 12% | 17% | 2003 | 22% | 23% |
| 1984 | 16% | 20% | 2004 | 23% | 25% |
| 1985 | 16% | 19% | 2005 | 21% | 24% |
| 1986 | 13% | 16% | 2006 | 22% | 27% |
| 1987 | 16% | 18% | 2007 | 21% | 26% |
| 1988 | 19% | 18% | 2008 | 23% | 27% |
| 1989 | 16% | 18% | 2009 | 23% | 23% |
| 1990 | 13% | 18% | 2010 | 20% | 25% |
| 1991 | 14% | 17% | 2011 | 22% | 30% |
| 1992 | 14% | 17% | 2012 | 24% | 29% |
| 1993 | 14% | 19% | 2013 | 22% | 28% |
| 1994 | 21% | 20% | 2014 | 24% | 28% |
| 1995 | 20% | 24% | 2015 | 23% | 26% |
| 1996 | 22% | 28% | 2016 | 22% | 25% |
| 1997 | 25% | 30% | 2017 | 25% | 29% |
| 1998 | 21% | 20% | 2018 | 30% | 31% |
| 1999 | 19% | 19% | | | |

World Bank.[11.04.2020]. https://data.worldbank.org/

## Appendix 6. Export, Import & Intra-industry Trade of In 2018 Automotive Industry (Codes are from HS System)

| Code | Intermediate Goods | Import | Export | Intra-industry |
|---|---|---|---|---|
| **72** | Iron and Steel | $18.401.424.849,00 | $ 11.576.032.122,00 | **0,772** |
| **87** | Vehicles; other railway or tramway rolling stock and parts and accessories thereof | $13.895.069.143,00 | $ 26.759.684.180,00 | **0,684** |
| **7204** | Ferrous waste and scrap; remelting scrap ingots of iron or steel | $ 7.137.092.306,00 | $ 218.847.878,00 | **0,06** |
| **8708** | Motor Vehicles; parts and accessories, of heading no. 8701 to 8705 | $ 5.967.196.115,00 | $ 4.534.378.723,00 | **0,864** |
| **8703** | Motor Cars and Other Motor Vehicles, principally designed for the transport of persons (other than those of heading no. 8702), including station wagons and racing cars | $ 5.905.951.050,00 | $ 12.442.525.094,00 | **0,644** |
| **76** | Aluminium and articles thereof | $ 3.872.389.061,00 | $ 2.995.625.461,00 | **0,872** |
| **7601** | Aluminium; unwrought | $ 2.555.100.076,00 | $ 144.321.352,00 | **0,107** |
| **7207** | Iron or non-alloy steel; semi-finished products thereof | $ 2.521.331.187,00 | $ 469.108.471,00 | **0,314** |
| **8408** | Compression-ignition internal combustion piston engines (diesel or semi-diesel) | $ 2.392.801.446,00 | $ 309.628.362,00 | **0,229** |
| **7208** | Iron or non-alloy steel; flat-rolled products of a width of 600mm or more, hot-rolled, not clad, plated or coated | $ 2.349.910.790,00 | $ 2.398.121.476,00 | **0,99** |
| **840820** | Engines; compression-ignition internal combustion piston engines (diesel or semi-diesel engines) of a kind used for propulsion of vehicles of chapter 87 | $ 2.042.961.241,00 | $ 289.060.951,00 | **0,248** |
| **8407** | Reciprocating or rotary internal combustion piston engines | $ 1.162.428.492,00 | $ 299.825.158,00 | **0,41** |
| **8421** | Centrifuges, including centrifugal dryers; filtering or purifying machinery and apparatus for liquids or gases | $ 1.159.852.110,00 | $ 427.842.190,00 | **0,539** |
| **7219** | Stainless steel; flat-rolled products of width of 600mm or more | $ 1.036.389.432,00 | $ 252.869.455,00 | **0,392** |
| **8704** | vehicles; for the transport of goods | $ 883.555.882,00 | $ 5.309.282.239,00 | **0,285** |
| **4011** | New pneumatic tyres of rubber | $ 849.393.954,00 | $ 1.379.387.270,00 | **0,762** |
| **840734** | Engines; reciprocating piston engines of a kind used for the propulsion of vehicles of chapter 87, of a cylinder capacity exceeding 1000cc | $ 810.410.519,00 | $ 174.976.894,00 | **0,355** |
| **8483** | Transmission shafts (including cam and crank), bearing housing and plain shaft bearings, gears and gearing, ball screws, gear boxes, flywheels and pulleys, clutches | $ 693.767.523,00 | $ 441.602.138,00 | **0,778** |
| **7202** | Ferro-alloys | $ 686.596.792,00 | $ 219.221.070,00 | **0,484** |

| | | | | |
|---|---|---|---|---|
| **3926** | Articles of plastics and articles of other materials of heading no.3901 to 3914 nes in chapter 39 | $ 635.689.869,00 | $ 415.594.810,00 | **0,791** |
| **840999** | Engines; parts for internal combustion piston engines (excluding spark-ignition) | $ 577.745.269,00 | $ 1.086.423.876,00 | **0,694** |
| **7201** | Pig iron and spiegeleisen in pigs, blocks or other primary forms | $ 508.891.464,00 | $ 2.016.523,00 | **0,008** |
| **8507** | Electric accumulators, including seperators therefor; whether or not rectangular (including square) | $ 496.332.604,00 | $ 386.750.352,00 | **0,876** |
| **8701** | tractors; (other than tractors heading no 8709) | $ 461.758.899,00 | $ 1.338.240.019,00 | **0,513** |
| **854430** | Insulated electric conductors; ignition wiring sets and other wiring sets of a kind used in vehicles, aircraft or ships | $ 437.665.300,00 | $ 170.174.567,00 | **0,56** |
| **4001** | Natural rubber, balata, gutta percha, guayule, chicle and similar gums, in primary forms or in plates, sheets or strip | $ 415.594.810,00 | $ 1.051.573,00 | **0,005** |
| **8482** | Ball or roller bearings | $ 413.595.645,00 | $ 135.924.924,00 | **0,495** |
| **8512** | Lighting or visual signalling equipment (excluding articles of heading no. 8539), windscreen wipers, defrosters and demisters, electrical, of a kind used for cycles or motor vehicles | $ 402.488.217,00 | $ 281.020.517,00 | **0,822** |
| **401120** | Rubber; new pneumatic tyres of a kind used on buses or lorries | $ 368.651.423,00 | $ 560.576.134,00 | **0,793** |
| **840733** | Engines; reciprocating piston engines of a kind used for the propulsion of vehicles of chapter 87, of a cylinder capacity exceeding 250 cc but not exceeding 1000cc | $ 296.569.498,00 | $ 121.451.205,00 | **0,581** |
| **8511** | Ignition or starting equipment; used for spark-ignition or compression-ignition internal combustion engines; generators and cuts outs used in conjunction with such engines | $ 251.816.817,00 | $ 137.126.086,00 | **0,705** |
| **841330** | Pumps; fuel, lubricating or cooling medium pumps for internal combustion piston engines | $ 250.527.457,00 | $ 38.706.523,00 | **0,268** |
| **8716** | Trailers and semi-trailers; other vehicles, not mechanically propolled; parts thereof | $ 188.140.661,00 | $ 641.944.747,00 | **0,453** |
| **7602** | Aluminium; waste and scrap | $ 146.239.351,00 | $ 47.559.161,00 | **0,491** |
| **842123** | Machinery; filtering or purifying machinery, oil or petrol filters for internal combustion engines | $ 140.527.463,00 | $ 83.199.076,00 | **0,744** |
| **830120** | Locks; of a kind used for motor vehicles (key, combination or electrically operated) of base metal | $ 119.612.311,00 | $ 31.909.384,00 | **0,421** |
| **8714** | Vehicles; parts and accessories, n.e.s. İn heading no.8711 to 8713 | $ 118.953.763,00 | $ 13.920.370,00 | **0,21** |
| **8711** | Motorcycles (including mopeds) and cyles, fitted with and auxiliary motor, with or without side-cars, side-cars | $ 111.507.756,00 | $ 4.411.824,00 | **0,076** |
| **830230** | Mountings; fittings and similar articles; for motor vehicles; of base metal | $ 102.169.527,00 | $ 92.182.596,00 | **0,949** |

| | | | | |
|---|---|---|---|---|
| **7203** | Ferrous products obtained by direct reduction of iron ore and other spongy ferrous products in lumps, pellets or the like iron having a minimum purify of 99.94% in lumps, pelletsor similar forms | $ 97.946.959,00 | $ 56.174,00 | **0,001** |
| **8484** | Gaskets and similar joints of metal sheeting combined with other material, sets or assortments of gaskets and the like, dissimilar in composition, put in pouches, envelopes or the like | $ 93.408.145,00 | $ 65.944.077,00 | **0,828** |
| **8705** | Special purpose motor vehicles, not those for the transport of persons or goods (eg breakdown lorries, road sweeper lorries, spraying lorries, mobile workshops, mobile radiological unit etc.) | $ 92.174.656,00 | $ 191.085.535,00 | **0,651** |
| **842131** | Machinery; intake air filters for internal combustion engines | $ 74.656.664,00 | $ 87.279.149,00 | **0,922** |
| **7604** | Aluminium; bars, rods and profiles | $ 67.171.922,00 | $ 824.194.466,00 | **0,151** |
| **7605** | Aluminium wire | $ 64.956.367,00 | $ 64.956.367,00 | **1** |
| **3918** | Floor coverings of plastics, self-adhesive or not, in rolls or tiles; wall or ceiling coverings of plastics, in rolls of a width not less than 45cm | $ 62.775.271,00 | $ 24.652.529,00 | **0,564** |
| **850220** | Electric generating sets; with spark-ignition internal combustion piston engines | $ 61.089.360,00 | $ 12.637.174,00 | **0,343** |
| **8702** | Vehicles; public transport passenger type | $ 56.588.526,00 | $ 1.792.552.144,00 | **0,061** |
| **7007** | Safety glass; consisting of toughened (tempered) or laminated glass | $ 44.576.074,00 | $ 129.669.956,00 | **0,512** |
| **4012** | Retreaded or used pneumatic tyres of rubber; solid or cushion tyres; tyre treads and tyre flaps of rubber | $ 42.221.774,00 | $ 6.439.273,00 | **0,265** |
| **7608** | Aluminium; tubes and pipes | $ 41.372.791,00 | $ 33.593.582,00 | **0,896** |
| **700910** | Glass; rear -view mirrors for vehicles | $ 40.999.433,00 | $ 26.349.580,00 | **0,782** |
| **830140** | Locks; (other than those for motor vehicles or furniture), (key combination or electrically operated) of base metal | $ 27.631.684,00 | $ 78.500.245,00 | **0,521** |
| **8715** | Baby carriages and parts thereof | $ 27.587.420,00 | $ 756.342,00 | **0,053** |
| **841520** | Air conditioning machines; comprising a motor driven fan and elements for changing the temperature and humidity of a kind used for persons in motor vehicles | $ 26.189.318,00 | $ 34.643.504,00 | **0,861** |
| **841181** | Turbines; gas-turbines (excluding turbo-jets and turbo-propellers) of a power not exceeding 5000kW | $ 25.814.718,00 | $ 22.501.199,00 | **0,931** |
| **940120** | Seats, of a kind used for motor vehicles | $ 23.345.273,00 | $ 208.088.527,00 | **0,202** |
| **7205** | Granules and powders, of pig iron, spiegeleisen, iron or steel | $ 19.948.979,00 | $ 20.349.209,00 | **0,99** |
| **840732** | Engines; reciprocating piston engines of a kind used for the propulsion of vehicles of | $ 17.296.639,00 | $ 77.387,00 | **0,009** |

| | | | | |
|---|---|---|---|---|
| | chapter 87, of a cylinder capacity exceeding 50 cc but not exceeding 250cc | | | |
| **8713** | Invalid carriages; whether or not motorised or otherwise mechanically propelled | $ 16.242.098,00 | $ 3.854.856,00 | **0,384** |
| **7603** | Aluminium; powders and flakes | $ 15.878.204,00 | $ 6.436.082,00 | **0,577** |
| **8609** | Containers (inluding containers for transport of fluids) specially designed and equipped for carriage by one or more modes of transport | $ 14.438.006,00 | $ 6.830.494,00 | **0,642** |
| **4013** | Inner tubes, of rubber | $ 14.149.577,00 | $ 1.808.621,00 | **0,227** |
| **8709** | Works trucks, self-propelled, (not fitted with lifting or handling equipment) for factories, warehouse etc. For short distance transport of goods, tractors used on railway station platforms, parts thereof | $ 13.707.208,00 | $ 4.806.134,00 | **0,519** |
| **8712** | Bicycles and other cycles; including delivery tricycles, not motorised | $ 12.897.514,00 | $ 37.879.014,00 | **0,508** |
| **960350** | Brushes; constituting parts of machines, appliances or vehicles | $ 12.648.464,00 | $ 2.297.846,00 | **0,307** |
| **732290** | Air heaters and hot air distributors, (not electrically heated), incorporating a motor-driven fan or blower and parts thereof, of iron or steel | $ 12.085.217,00 | $ 2.932.368,00 | **0,391** |
| **8707** | Bodies; (including cabs) for the motor vehicles of heading no. 8701 to 8705 | $ 11.298.946,00 | $ 80.535.904,00 | **0,246** |
| **681381** | Brake lining and pads; with a basis of mineral substances or cellulose (other than asbestos) | $ 10.129.589,00 | $ 7.431.226,00 | **0,846** |
| **842691** | Cranes and derricks; designed for mounting on road vehicles | $ 7.303.040,00 | $ 3.020.859,00 | **0,585** |
| **700711** | Glass; safety glass, toughened (tempered) of size and shape suitable for incorporation in vehicles, aircraft, spacecraft or vessels | $ 6.556.233,00 | $ 17.954.970,00 | **0,535** |
| **840731** | Engines; reciprocating piston engines of a kind used for the propulsion of vehicles of chapter 87, of a cylinder capacity not exceeding 50 cc | $ 6.425.535,00 | $ 5.990,00 | **0,002** |
| **401140** | Rubber; new pneumatic tyres of a kind used on motorcycles | $ 5.831.358,00 | $ 2.468.027,00 | **0,595** |
| **8706** | Chassis, fitted with engines, for the motor vehicles of heading no 8701 to 8705 | $ 5.688.455,00 | $ 12.165.236,00 | **0,637** |
| **8604** | Railway or tramway maintenance or service vehicles; whether or not self-propelled (eg workshops, cranes, ballast tampers, trackliners, testing coaches and track inspection vehicles) | $ 3.831.677,00 | $ 4.873.271,00 | **0,88** |
| **9104** | Instrument panel clocks and clocks of a similar type for vehicles, aircraft, spacecraft or vessels | $ 2.742.286,00 | $ 303.388,00 | **0,199** |
| **2519** | Natural magnesium carbonate (magnesite); fused magnesia; dead burned(sintered) magnesia, whether or not containing small quantities of other oxides added before sintering; magnesium oxide, pure or not | $ 2.086.048,00 | $ 2.307.546,00 | **0,95** |

| | | | | |
|---|---|---|---|---|
| **283321** | Sulphates; of magnesium | $ 1.096.733,00 | $ 2.536.955,00 | **0,604** |
| **7206** | Iron and non-alloy steel in ingots or other primary forms (excluding iron of heading no. 7203) | $ 1.045.247,00 | $ 307.340,00 | **0,454** |
| **5905** | Textile Wall coverings | $ 562.725,00 | $ 179.373,00 | **0,483** |
| **7218** | Stainless steel in ingots or other primary forms; semi-finished products of stainless steel | $ 222.784,00 | $ 380.883,00 | **0,738** |
| **7611** | Aluminium; reservoirs, tanks, vats and the like for material (not compressed or liquefied gas) of capacity over 300l, whether or not lined, heat-insulated, not fitted with mechanical thermal equipment | $ 8.316,00 | $ 3.687.950,00 | **0,004** |
| **8710** | Tanks and other armoured fighting vehicles; motorised whether or not fitted with weapons and parts of such vehicles | | | |
| **681320** | Friction material and articles thereof (e.g. Sheets, rolls, strips, segments, discs, washers, pads) not mounted; for brakes, clutches or the like, with a basis of asbestos | | $ 747.387,00 | |

## Appendix 7. Export, Import & Intra-industry Trade of In 2011 Automotive Industry (Codes are from HS System)

| Code | Intermediate Goods | Import | Export | Intra-industry |
|---|---|---|---|---|
| **72** | Iron and Steel | $ 20.424.235.103,00 | $ 11.225.328.562,00 | **-0,819** |
| **87** | Vehicles; other railway or tramway rolling stock and parts and accessories thereof | $ 17.184.080.117,00 | $ 15.803.438.311,00 | **-0,087** |
| **7204** | Ferrous waste and scrap; remelting scrap ingots of iron or steel | $ 9.767.304.773,00 | $ 204.197.458,00 | **-46,833** |
| **8703** | Motor Cars and Other Motor Vehicles, principally designed for the transport of persons (other than those of heading no. 8702), including station wagons and racing cars | $ 8.477.252.164,00 | $ 6.485.592.250,00 | **-0,307** |
| **8708** | Motor Vehicles; parts and accessories, of heading no. 8701 to 8705 | $ 5.230.312.615,00 | $ 3.371.038.483,00 | **-0,552** |
| **76** | Aluminium and articles thereof | $ 3.258.884.982,00 | $ 2.285.695.345,00 | **-0,426** |
| **8408** | Compression-ignition internal combustion piston engines (diesel or semi-diesel) | $ 2.662.027.114,00 | $ 240.067.199,00 | **-10,089** |
| **7208** | Iron or non-alloy steel; flat-rolled products of a width of 600mm or more, hot-rolled, not clad, plated or coated | $ 2.565.425.849,00 | $ 1.237.237.288,00 | **-1,074** |
| **7601** | Aluminium; unwrought | $ 2.353.232.094,00 | $ 112.863.798,00 | **-19,850** |
| **840820** | Engines; compression-ignition internal combustion piston engines (diesel or semi-diesel engines) of a kind used for propulsion of vehicles of chapter 87 | $ 2.242.156.901,00 | $ 225.268.864,00 | **-8,953** |
| **7207** | Iron or non-alloy steel; semi-finished products thereof | $ 1.442.834.777,00 | $ 1.530.857.544,00 | **0,057** |
| **8704** | vehicles; for the transport of goods | $ 1.279.880.581,00 | $ 3.963.070.253,00 | **0,677** |
| **8701** | tractors; (other than tractors heading no 8709) | $ 1.223.230.369,00 | $ 369.037.816,00 | **-2,315** |
| **7219** | Stainless steel; flat-rolled products of width of 600mm or more | $ 925.029.297,00 | $ 75.829.481,00 | **-11,199** |
| **4011** | New pneumatic tyres of rubber | $ 833.015.202,00 | $ 1.373.785.996,00 | **0,394** |
| **8421** | Centrifuges, including centrifugal dryers; filtering or purifying machinery and apparatus for liquids or gases | $ 743.053.094,00 | $ 251.780.898,00 | **-1,951** |
| **4001** | Natural rubber, balata, gutta percha, guayule, chicle and similar gums, in primary forms or in plates, sheets or strip | $ 724.017.843,00 | $ 2.477.157,00 | **-291,278** |
| **7202** | Ferro-alloys | $ 698.009.192,00 | $ 131.409.943,00 | **-4,312** |

| | | | | |
|---|---|---|---|---|
| **8483** | Transmission shafts (including cam and crank), bearing housing and plain shaft bearings, gears and gearing, ball screws, gear boxes, flywheels and pulleys, clutches | $ 618.560.204,00 | $ 273.972.260,00 | **-1,258** |
| **3926** | Articles of plastics and articles of other materials of heading no.3901 to 3914 nes in chapter 39 | $ 616.881.130,00 | $ 263.704.153,00 | **-1,339** |
| **7201** | Pig iron and spiegeleisen in pigs, blocks or other primary forms | $ 598.263.000,00 | $ 5.683.665,00 | **-104,260** |
| **840999** | Engines; parts for internal combustion piston engines (excluding spark-ignition) | $ 535.778.045,00 | $ 1.004.610.381,00 | **0,467** |
| **8407** | Reciprocating or rotary internal combustion piston engines | $ 451.884.554,00 | $ 54.461.301,00 | **-7,297** |
| **8482** | Ball or roller bearings | $ 420.925.864,00 | $ 115.854.844,00 | **-2,633** |
| **401120** | Rubber; new pneumatic tyres of a kind used on buses or lorries | $ 391.213.372,00 | $ 682.878.859,00 | **0,427** |
| **840734** | Engines; reciprocating piston engines of a kind used for the propulsion of vehicles of chapter 87, of a cylinder capacity exceeding 1000cc | $ 382.054.008,00 | $ 50.024.143,00 | **-6,637** |
| **8507** | Electric accumulators, including seperators therefor; whether or not rectangular (including square) | $ 275.251.097,00 | $ 227.455.663,00 | **-0,210** |
| **8702** | Vehicles; public transport passenger type | $ 266.513.888,00 | $ 1.043.760.470,00 | **0,745** |
| **8716** | Trailers and semi-trailers; other vehicles, not mechanically propolled; parts thereof | $ 260.935.456,00 | $ 199.980.169,00 | **-0,305** |
| **8511** | Ignition or starting equipment; used for spark-ignition or compression-ignition internal combustion engines; generators and cuts outs used in conjunction with such engines | $ 247.675.306,00 | $ 86.965.087,00 | **-1,848** |
| **8512** | Lighting or visual signalling equipment (excluding articles of heading no. 8539), windscreen wipers, defrosters and demisters, electrical, of a kind used for cycles or motor vehicles | $ 246.025.113,00 | $ 142.015.369,00 | **-0,732** |
| **854430** | Insulated electric conductors; ignition wiring sets and other wiring sets of a kind used in vehicles, aircraft or ships | $ 197.149.559,00 | $ 278.403.263,00 | **0,292** |
| **850220** | Electric generating sets; with spark-ignition internal combustion piston engines | $ 188.273.527,00 | $ 7.597.173,00 | **-23,782** |
| **8714** | Vehicles; parts and accessories, n.e.s. İn heading no.8711 to 8713 | $ 153.929.561,00 | $ 20.396.216,00 | **-6,547** |
| **842123** | Machinery; filtering or purifying machinery, oil or petrol filters for internal combustion engines | $ 122.848.463,00 | $ 49.996.350,00 | **-1,457** |

| | | | | | |
|---|---|---|---|---|---|
| **8705** | Special purpose motor vehicles, not those for the transport of persons or goods (eg breakdown lorries, road sweeper lorries, spraying lorries, mobile workshops, mobile radiological unit etc.) | $ | 109.907.921,00 | $ 107.570.312,00 | **-0,022** |
| **830120** | Locks; of a kind used for motor vehicles (key, combination or electrically operated) of base metal | $ | 101.139.826,00 | $ 27.623.976,00 | **-2,661** |
| **8711** | Motorcycles (including mopeds) and cyles, fitted with and auxiliary motor, with or without side-cars, side-cars | $ | 80.826.294,00 | $ 14.878.205,00 | **-4,433** |
| **830230** | Mountings; fittings and similar articles; for motor vehicles; of base metal | $ | 77.428.371,00 | $ 32.597.991,00 | **-1,375** |
| **842131** | Machinery; intake air filters for internal combustion engines | $ | 77.414.176,00 | $ 54.028.530,00 | **-0,433** |
| **7203** | Ferrous products obtained by direct reduction of iron ore and other spongy ferrous products in lumps, pellets or the like iron having a minimum purify of 99.94% in lumps, pelletsor similar forms | $ | 74.569.271,00 | $ 1.150.767,00 | **-63,800** |
| **7007** | Safety glass; consisting of toughened (tempered) or laminated glass | $ | 72.040.191,00 | $ 179.886.991,00 | **0,600** |
| **8484** | Gaskets and similar joints of metal sheeting combined with other material, sets or assortments of gaskets and the like, dissimilar in composition, put in pouches, envelopes or the like | $ | 70.662.614,00 | $ 21.745.192,00 | **-2,250** |
| **3918** | Floor coverings of plastics, self-adhesive or not, in rolls or tiles; wall or ceiling coverings of plastics, in rolls of a width not less than 45cm | $ | 58.910.721,00 | $ 38.037.433,00 | **-0,549** |
| **7608** | Aluminium; tubes and pipes | $ | 53.251.734,00 | $ 38.672.919,00 | **-0,377** |
| **830140** | Locks; (other than those for motor vehicles or furniture), (key combination or electrically operated) of base metal | $ | 51.827.426,00 | $ 84.031.640,00 | **0,383** |
| **7602** | Aluminium; waste and scrap | $ | 47.477.242,00 | $ 22.273.104,00 | **-1,132** |
| **7605** | Aluminium wire | $ | 47.189.114,00 | $ 29.790.296,00 | **-0,584** |
| **2519** | Natural magnesium carbonate (magnesite); fused magnesia; dead burned(sintered) magnesia, whether or not containing small quantities of other oxides added before sintering; magnesium oxide, pure or not | $ | 46.360.906,00 | $ 90.465.857,00 | **0,488** |
| **8604** | Railway or tramway maintenance or service vehicles; whether or not self-propelled (eg workshops, cranes, ballast tampers, trackliners, testing coaches and track inspection vehicles) | $ | 46.136.659,00 | $ 15.451,00 | **-2984,998** |
| **7604** | Aluminium; bars, rods and profiles | $ | 45.195.255,00 | $ 628.797.056,00 | **0,928** |

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| **840732** | Engines; reciprocating piston engines of a kind used for the propulsion of vehicles of chapter 87, of a cylinder capacity exceeding 50 cc but not exceeding 250cc | $ | 44.482.546,00 | $ | 11.919,00 | **-3731,070** |
| **700910** | Glass; rear -view mirrors for vehicles | $ | 36.164.523,00 | $ | 10.346.197,00 | **-2,495** |
| **4012** | Retreaded or used pneumatic tyres of rubber; solid or cushion tyres; tyre treads and tyre flaps of rubber | $ | 28.962.135,00 | $ | 7.383.122,00 | **-2,923** |
| **8715** | Baby carriages and parts thereof | $ | 26.348.523,00 | $ | 553.280,00 | **-46,622** |
| **8707** | Bodies; (including cabs) for the motor vehicles of heading no. 8701 to 8705 | $ | 24.472.802,00 | $ | 52.958.038,00 | **0,538** |
| **7205** | Granules and powders, of pig iron, spiegeleisen, iron or steel | $ | 22.881.233,00 | $ | 23.206.416,00 | **0,014** |
| **681381** | Brake lining and pads; with a basis of mineral substances or cellulose (other than asbestos) | $ | 20.377.827,00 | $ | 2.656.057,00 | **-6,672** |
| **700711** | Glass; safety glass, toughened (tempered) of size and shape suitable for incorporation in vehicles, aircraft, spacecraft or vessels | $ | 20.232.076,00 | $ | 42.600.070,00 | **0,525** |
| **841520** | Air conditioning machines; comprising a motor driven fan and elements for changing the temperature and humidity of a kind used for persons in motor vehicles | $ | 19.596.419,00 | $ | 20.354.388,00 | **0,037** |
| **4013** | Inner tubes, of rubber | $ | 19.212.490,00 | $ | 1.564.665,00 | **-11,279** |
| **940120** | Seats, of a kind used for motor vehicles | $ | 17.930.642,00 | $ | 143.118.820,00 | **0,875** |
| **732290** | Air heaters and hot air distributors, (not electrically heated), incorporating a motor-driven fan or blower and parts thereof, of iron or steel | $ | 13.577.251,00 | $ | 3.293.412,00 | **-3,123** |
| **842691** | Cranes and derricks; designed for mounting on road vehicles | $ | 13.072.858,00 | $ | 5.223.708,00 | **-1,503** |
| **960350** | Brushes; constituting parts of machines, appliances or vehicles | $ | 12.639.915,00 | $ | 1.474.278,00 | **-7,574** |
| **8709** | Works trucks, self-propelled, (not fitted with lifting or handling equipment) for factories, warehouse etc. For short distance transport of goods, tractors used on railway station platforms, parts thereof | $ | 11.419.955,00 | $ | 1.314.851,00 | **-7,685** |
| **8713** | Invalid carriages; whether or not motorised or otherwise mechanically propelled | $ | 9.392.587,00 | $ | 597.927,00 | **-14,709** |
| **8609** | Containers (inluding containers for transport of fluids) specially designed and equipped for carriage by one or more modes of transport | $ | 8.804.064,00 | $ | 8.278.885,00 | **-0,063** |
| **401140** | Rubber; new pneumatic tyres of a kind used on motorcycles | $ | 8.765.199,00 | $ | 356.360,00 | **-23,596** |
| **8712** | Bicycles and other cycles; including delivery tricycles, not motorised | $ | 7.294.612,00 | $ | 28.404.273,00 | **0,743** |

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|---|---|---|---|---|---|---|
| **681320** | Friction material and articles thereof (e.g. Sheets, rolls, strips, segments, discs, washers, pads) not mounted; for brakes, clutches or the like, with a basis of asbestos | $ | 6.424.005,00 | $ | 1.109.445,00 | **-4,790** |
| **9104** | Instrument panel clocks and clocks of a similar type for vehicles, aircraft, spacecraft or vessels | $ | 6.062.693,00 | $ | 184.021,00 | **-31,946** |
| **841181** | Turbines; gas-turbines (excluding turbo-jets and turbo-propellers) of a power not exceeding 5000kW | $ | 5.886.405,00 | $ | 964.368,00 | **-5,104** |
| **8706** | Chassis, fitted with engines, for the motor vehicles of heading no 8701 to 8705 | $ | 1.967.025,00 | $ | 384.683,00 | **-4,113** |
| **7218** | Stainless steel in ingots or other primary forms; semi-finished products of stainless steel | $ | 1.107.585,00 | $ | 321.803,00 | **-2,442** |
| **5905** | Textile Wall coverings | $ | 861.003,00 | $ | 197.497,00 | **-3,360** |
| **7611** | Aluminium; reservoirs, tanks, vats and the like for material (not compressed or liquefied gas) of capacity over 300l, whether or not lined, heat-insulated, not fitted with mechanical thermal equipment | $ | 518.981,00 | $ | 2.015.739,00 | **0,743** |
| **283321** | Sulphates; of magnesium | $ | 501.553,00 | $ | 907.326,00 | **0,447** |
| **7603** | Aluminium; powders and flakes | $ | 133.434,00 | $ | 16.899.716,00 | **0,992** |
| **840733** | Engines; reciprocating piston engines of a kind used for the propulsion of vehicles of chapter 87, of a cylinder capacity exceeding 250 cc but not exceeding 1000cc | $ | 108.015,00 | $ | 22.618,00 | **-3,776** |
| **7206** | Iron and non-alloy steel in ingots or other primary forms (excluding iron of heading no. 7203) | $ | 72.164,00 | $ | 529.125,00 | **0,864** |
| **840731** | Engines; reciprocating piston engines of a kind used for the propulsion of vehicles of chapter 87, of a cylinder capacity not exceeding 50 cc | $ | 11.293,00 | $ | 1.206.311,00 | **0,991** |
| **8710** | Tanks and other armoured fighting vehicles; motorised whether or not fitted with weapons and parts of such vehicles | | | | | |
| **841330** | Pumps; fuel, lubricating or cooling medium pumps for internal combustion piston engines | | | | | |

## Appendix 8. Export, Import & Intra-industry Trade of In 2004 Automotive Industry (Codes are from HS System)

| Code | Intermediate Goods | Import | Export | Intra-industry |
|---|---|---|---|---|
| **87** | Vehicles; other railway or tramway rolling stock and parts and accessories thereof | $ 10.237.023.930,00 | $ 8.288.798.566,00 | **0,895** |
| **72** | Iron and Steel | $ 8.031.521.805,00 | $ 5.313.307.530,00 | **0,796** |
| **8703** | Motor Cars and Other Motor Vehicles, principally designed for the transport of persons (other than those of heading no. 8702), including station wagons and racing cars | $ 4.214.587.976,00 | $ 3.933.684.540,00 | **0,966** |
| **8708** | Motor Vehicles; parts and accessories, of heading no. 8701 to 8705 | $ 3.109.809.269,00 | $ 1.198.880.380,00 | **0,556** |
| **7204** | Ferrous waste and scrap; remelting scrap ingots of iron or steel | $ 3.013.744.966,00 | $ 67.591.154,00 | **0,044** |
| **8704** | vehicles; for the transport of goods | $ 1.872.141.241,00 | $ 2.212.654.728,00 | **0,917** |
| **7208** | Iron or non-alloy steel; flat-rolled products of a width of 600mm or more, hot-rolled, not clad, plated or coated | $ 1.602.719.969,00 | $ 191.208.893,00 | **0,213** |
| **8408** | Compression-ignition internal combustion piston engines (diesel or semi-diesel) | $ 1.419.928.423,00 | $ 13.233.217,00 | **0,018** |
| **840820** | Engines; compression-ignition internal combustion piston engines (diesel or semi-diesel engines) of a kind used for propulsion of vehicles of chapter 87 | $ 1.235.741.540,00 | $ 3.663.897,00 | **0,006** |
| **76** | Aluminium and articles thereof | $ 960.581.593,00 | $ 649.488.368,00 | **0,807** |
| **7207** | Iron or non-alloy steel; semi-finished products thereof | $ 628.753.689,00 | $ 1.298.585.075,00 | **0,652** |
| **7601** | Aluminium; unwrought | $ 599.142.087,00 | $ 12.552.301,00 | **0,041** |
| **8701** | tractors; (other than tractors heading no 8709) | $ 580.361.021,00 | $ 193.128.419,00 | **0,499** |
| **7219** | Stainless steel; flat-rolled products of width of 600mm or more | $ 376.469.564,00 | $ 42.390.701,00 | **0,202** |
| **8421** | Centrifuges, including centrifugal dryers; filtering or purifying machinery and apparatus for liquids or gases | $ 339.868.977,00 | $ 86.107.681,00 | **0,404** |
| **7202** | Ferro-alloys | $ 334.690.012,00 | $ 21.083.770,00 | **0,119** |
| **4011** | New pneumatic tyres of rubber | $ 323.569.686,00 | $ 533.199.524,00 | **0,755** |
| **3926** | Articles of plastics and articles of other materials of heading no.3901 to 3914 nes in chapter 39 | $ 317.215.140,00 | $ 103.205.444,00 | **0,491** |
| **840999** | Engines; parts for internal combustion piston engines (excluding spark-ignition) | $ 297.320.238,00 | $ 602.663.249,00 | **0,661** |
| **8483** | Transmission shafts (including cam and crank), bearing housing and plain shaft bearings, gears and gearing, ball screws, gear boxes, flywheels and pulleys, clutches | $ 218.749.903,00 | $ 93.694.848,00 | **0,6** |
| **8407** | Reciprocating or rotary internal combustion piston engines | $ 213.171.413,00 | $ 10.785.357,00 | **0,096** |

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|---|---|---|---|---|
| **8482** | Ball or roller bearings | $ 205.510.292,00 | $ 49.499.662,00 | **0,388** |
| **840734** | Engines; reciprocating piston engines of a kind used for the propulsion of vehicles of chapter 87, of a cylinder capacity exceeding 1000cc | $ 191.954.479,00 | $ 9.731.246,00 | **0,096** |
| **8511** | Ignition or starting equipment; used for spark-ignition or compression-ignition internal combustion engines; generators and cuts outs used in conjunction with such engines | $ 142.607.047,00 | $ 46.865.323,00 | **0,495** |
| **8512** | Lighting or visual signalling equipment (excluding articles of heading no. 8539), windscreen wipers, defrosters and demisters, electrical, of a kind used for cycles or motor vehicles | $ 131.815.284,00 | $ 28.015.859,00 | **0,351** |
| **8716** | Trailers and semi-trailers; other vehicles, not mechanically propolled; parts thereof | $ 121.150.180,00 | $ 67.416.319,00 | **0,715** |
| **401120** | Rubber; new pneumatic tyres of a kind used on buses or lorries | $ 115.918.291,00 | $ 216.034.517,00 | **0,698** |
| **8711** | Motorcycles (including mopeds) and cyles, fitted with and auxiliary motor, with or without side-cars, side-cars | $ 99.994.820,00 | $ 11.936.581,00 | **0,213** |
| **841330** | Pumps; fuel, lubricating or cooling medium pumps for internal combustion piston engines | $ 95.002.972,00 | $ 9.774.158,00 | **0,187** |
| **7201** | Pig iron and spiegeleisen in pigs, blocks or other primary forms | $ 88.571.588,00 | $ 17.171.365,00 | **0,325** |
| **854430** | Insulated electric conductors; ignition wiring sets and other wiring sets of a kind used in vehicles, aircraft or ships | $ 73.044.252,00 | $ 12.209.869,00 | **0,286** |
| **8507** | Electric accumulators, including seperators therefor; whether or not rectangular (including square) | $ 69.346.836,00 | $ 57.362.620,00 | **0,905** |
| **830230** | Mountings; fittings and similar articles; for motor vehicles; of base metal | $ 67.028.246,00 | $ 9.874.138,00 | **0,257** |
| **8702** | Vehicles; public transport passenger type | $ 66.688.468,00 | $ 556.380.596,00 | **0,214** |
| **8714** | Vehicles; parts and accessories, n.e.s. İn heading no.8711 to 8713 | $ 66.569.829,00 | $ 18.078.103,00 | **0,427** |
| **8705** | Special purpose motor vehicles, not those for the transport of persons or goods (eg breakdown lorries, road sweeper lorries, spraying lorries, mobile workshops, mobile radiological unit etc.) | $ 64.448.324,00 | $ 39.197.145,00 | **0,756** |
| **842123** | Machinery; filtering or purifying machinery, oil or petrol filters for internal combustion engines | $ 59.693.146,00 | $ 20.156.582,00 | **0,505** |
| **7007** | Safety glass; consisting of toughened (tempered) or laminated glass | $ 51.132.918,00 | $ 76.479.491,00 | **0,801** |
| **830120** | Locks; of a kind used for motor vehicles (key, combination or electrically operated) of base metal | $ 42.756.307,00 | $ 3.843.444,00 | **0,165** |
| **3918** | Floor coverings of plastics, self-adhesive or not, in rolls or tiles; wall or ceiling coverings of plastics, in rolls of a width not less than 45cm | $ 33.094.184,00 | $ 14.668.214,00 | **0,614** |

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| **8484** | Gaskets and similar joints of metal sheeting combined with other material, sets or assortments of gaskets and the like, dissimilar in composition, put in pouches, envelopes or the like | $ 29.156.421,00 | $ 5.948.805,00 | **0,339** |
| **700910** | Glass; rear -view mirrors for vehicles | $ 28.636.782,00 | $ 5.417.745,00 | **0,318** |
| **842131** | Machinery; intake air filters for internal combustion engines | $ 25.425.900,00 | $ 17.426.916,00 | **0,813** |
| **850220** | Electric generating sets; with spark-ignition internal combustion piston engines | $ 22.264.200,00 | $ 5.944.541,00 | **0,421** |
| **7604** | Aluminium; bars, rods and profiles | $ 21.281.163,00 | $ 215.688.711,00 | **0,18** |
| **700711** | Glass; safety glass, toughened (tempered) of size and shape suitable for incorporation in vehicles, aircraft, spacecraft or vessels | $ 19.637.847,00 | $ 9.272.844,00 | **0,641** |
| **2519** | Natural magnesium carbonate (magnesite); fused magnesia; dead burned(sintered) magnesia, whether or not containing small quantities of other oxides added before sintering; magnesium oxide, pure or not | $ 17.263.337,00 | $ 47.434.070,00 | **0,534** |
| **7605** | Aluminium wire | $ 15.513.342,00 | $ 2.122.831,00 | **0,241** |
| **7602** | Aluminium; waste and scrap | $ 14.367.610,00 | $ 12.438.354,00 | **0,928** |
| **830140** | Locks; (other than those for motor vehicles or furniture), (key combination or electrically operated) of base metal | $ 13.427.293,00 | $ 25.055.938,00 | **0,698** |
| **7205** | Granules and powders, of pig iron, spiegeleisen, iron or steel | $ 13.087.368,00 | $ 2.805.297,00 | **0,353** |
| **8707** | Bodies; (including cabs) for the motor vehicles of heading no. 8701 to 8705 | $ 12.833.257,00 | $ 10.774.238,00 | **0,913** |
| **7608** | Aluminium; tubes and pipes | $ 12.261.988,00 | $ 5.523.997,00 | **0,621** |
| **940120** | Seats, of a kind used for motor vehicles | $ 11.437.715,00 | $ 82.366.629,00 | **0,244** |
| **8715** | Baby carriages and parts thereof | $ 9.233.783,00 | $ 541.553,00 | **0,111** |
| **4013** | Inner tubes, of rubber | $ 8.982.292,00 | $ 810.035,00 | **0,165** |
| **4012** | Retreaded or used pneumatic tyres of rubber; solid or cushion tyres; tyre treads and tyre flaps of rubber | $ 8.788.829,00 | $ 4.207.576,00 | **0,647** |
| **8609** | Containers (inluding containers for transport of fluids) specially designed and equipped for carriage by one or more modes of transport | $ 8.332.600,00 | $ 18.460.830,00 | **0,622** |
| **841181** | Turbines; gas-turbines (excluding turbo-jets and turbo-propellers) of a power not exceeding 5000kW | $ 7.747.529,00 | $ 1.372.806,00 | **0,301** |
| **8709** | Works trucks, self-propelled, (not fitted with lifting or handling equipment) for factories, warehouse etc. For short distance transport of goods, tractors used on railway station platforms, parts thereof | $ 7.278.250,00 | $ 298.740,00 | **0,079** |

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|---|---|---|---|---|---|
| **8604** | Railway or tramway maintenance or service vehicles; whether or not self-propelled (eg workshops, cranes, ballast tampers, trackliners, testing coaches and track inspection vehicles) | $ | 6.667.588,00 | $ 224,00 | **0** |
| **841520** | Air conditioning machines; comprising a motor driven fan and elements for changing the temperature and humidity of a kind used for persons in motor vehicles | $ | 5.596.003,00 | $ 160.421,00 | **0,056** |
| **7603** | Aluminium; powders and flakes | $ | 5.368.779,00 | $ 121.778,00 | **0,044** |
| **732290** | Air heaters and hot air distributors, (not electrically heated), incorporating a motor-driven fan or blower and parts thereof, of iron or steel | $ | 5.083.294,00 | $ 1.609.908,00 | **0,481** |
| **8710** | Tanks and other armoured fighting vehicles; motorised whether or not fitted with weapons and parts of such vehicles | $ | 4.686.377,00 | $ 5.851.617,00 | **0,889** |
| **960350** | Brushes; constituting parts of machines, appliances or vehicles | $ | 4.125.634,00 | $ 1.006.383,00 | **0,392** |
| **8706** | Chassis, fitted with engines, for the motor vehicles of heading no 8701 to 8705 | $ | 3.968.973,00 | $ 12.815.110,00 | **0,473** |
| **7203** | Ferrous products obtained by direct reduction of iron ore and other spongy ferrous products in lumps, pellets or the like iron having a minimum purify of 99.94% in lumps, pelletsor similar forms | $ | 2.792.592,00 | $ 35.615,00 | **0,025** |
| **8713** | Invalid carriages; whether or not motorised or otherwise mechanically propelled | $ | 1.697.215,00 | $ 582.485,00 | **0,511** |
| **8712** | Bicycles and other cycles; including delivery tricycles, not motorised | $ | 1.574.947,00 | $ 21.785.000,00 | **0,135** |
| **401140** | Rubber; new pneumatic tyres of a kind used on motorcycles | $ | 1.495.060,00 | $ 144.579,00 | **0,176** |
| **840732** | Engines; reciprocating piston engines of a kind used for the propulsion of vehicles of chapter 87, of a cylinder capacity exceeding 50 cc but not exceeding 250cc | $ | 1.120.072,00 | $ 34.218,00 | **0,059** |
| **842691** | Cranes and derricks; designed for mounting on road vehicles | $ | 1.050.393,00 | $ 1.278.357,00 | **0,902** |
| **7611** | Aluminium; reservoirs, tanks, vats and the like for material (not compressed or liquefied gas) of capacity over 300l, whether or not lined, heat-insulated, not fitted with mechanical thermal equipment | $ | 995.734,00 | $ 422.388,00 | **0,596** |
| **9104** | Instrument panel clocks and clocks of a similar type for vehicles, aircraft, spacecraft or vessels | $ | 784.585,00 | $ 117.865,00 | **0,261** |
| **7218** | Stainless steel in ingots or other primary forms; semi-finished products of stainless steel | $ | 659.337,00 | $ 213.655,00 | **0,489** |
| **4001** | Natural rubber, balata, gutta percha, guayule, chicle and similar gums, in primary forms or in plates, sheets or strip | $ | 436.572,00 | $ 167.595.127,00 | **0,005** |
| **5905** | Textile Wall coverings | $ | 201.255,00 | $ 91.456,00 | **0,625** |

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|---|---|---|---|---|---|
| **7206** | Iron and non-alloy steel in ingots or other primary forms (excluding iron of heading no. 7203) | $ 100.975,00 | $ 240.475,00 | **0,591** |
| **840733** | Engines; reciprocating piston engines of a kind used for the propulsion of vehicles of chapter 87, of a cylinder capacity exceeding 250 cc but not exceeding 1000cc | $ 96.027,00 | $ 15.437,00 | **0,277** |
| **283321** | Sulphates; of magnesium | $ 12.403,00 | $ 366.236,00 | **0,066** |
| **840731** | Engines; reciprocating piston engines of a kind used for the propulsion of vehicles of chapter 87, of a cylinder capacity not exceeding 50 cc | $ 11.627,00 | $ 635.287,00 | **0,036** |
| **681320** | Friction material and articles thereof (e.g. Sheets, rolls, strips, segments, discs, washers, pads) not mounted; for brakes, clutches or the like, with a basis of asbestos | | | |
| **681381** | Brake lining and pads; with a basis of mineral substances or cellulose (other than asbestos) | | | |