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Political Economy of Industrial Policy in Turkey

The Case of Automotive Industry *

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Özet:

Bu raporda Türkiye'deki sanayi ve ticaret politikaları, otomotiv sektörüne etkileri bağlamında analiz edilmiştir. 1960'ların ve 1970'lerin ithal ikameci sanayileşme döneminde kurulan Türkiye otomotiv sanayi, Türkiye ile AB arasında imzalanan ve 1996 yılında yürürlüğe giren Gümrük Birliği anlaşması ile açılan fırsatı iyi değerlendirmiştir. Dolayısıyla otomotiv sanayi, başlangıçta korumalı bir iç pazara sahip olan bir sanayinin Yabancı Sermaye Yatırımları girişleri yoluyla nasıl rekabetçi ve giderek artan bir biçimde ihracata yönelen bir sanayiye dönüştürülebileceğine iyi bir örnek teşkil etmektedir.

Çalışmamızın önemli sonuçlarından biri olarak, Türkiye otomotiv sanayisinin mevcut durumuna gelmesinin arkasında, iyi tasarlanmış uzun vadeli bir sınai kalkınma perspektifinin olmadığı vurgulanmaktadır. Aksine, son yıllarda iyi bir performans sergileyen otomotiv firmaları, bu başarıyı, kendi örgütsel yetenekleri ve uluslararası rekabet deneyimi sayesinde yakalamıştır. İhracat eğilimlerine ilişkin analizimiz, Türkiye'nin uluslararası iş bölümündeki yerinin çok uluslu firmaların kararlarıyla belirlenmiş olduğunu göstermektedir. Türkiye'deki motorlu taşıt üreticileri coğrafya avantajlarını (Avrupa pazarlarına yakınlığı) ve ülkenin metal işçiliği kapasitesini ustalıkla yöneterek Avrupa değer zincirlerindeki yerlerini yeniden ayarlayabilmişlerdir. Ancak, Türkiye'nin ağırlıkla dolaylı vergilere dayanan mevcut vergi politikaları, prensip olarak üretimlerini ve Ar-Ge faaliyetlerini sanayinin yüksek kalite / yüksek katma değerli kesimlerine yönlendirebilecek olan otomotiv firmalarının önünde önemli bir engel teşkil etmektedir.

* Rapor, gelişmekte olan ülkelerin yararına Birleşik Krallık hükümetinden Birleşik Krallık Yardımı'nın desteklediği "Etkin Devletler ve Bütünleştirici Gelişim Araştırma Merkezi" (ESID) tarafından finanse edildi. Ancak, bu dokümanda dile getirilen ve bulunan bilgi, Birleşik Krallık hükümetine ait veya Birleşik Krallık hükümetinin desteklediği görüşler olduğu anlamına gelmez, ve bundan dolayı ne bu belge için, ne de bu belgeye dayanarak beyan edilecek görüş ve bilgiler için sorumluluk kabul etmemektedir.
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Abstract:

In this report, we analyze the industrial and trade policies in Turkey in relation with their impact on the automotive industry. Established during the import substituting industrialization era of the 1960s and 1970s, Turkish automotive industry had seized the opportunities opened up with the Customs Union agreement between Turkey and the EU that went into effect in 1996. As such, it provides a good example of how an industry with an initially protected home market can be transformed into a competitive and increasingly export-oriented industry through FDI inflows.

In one of the important conclusions of our study, we emphasize the lack of a well-designed long-term industrial development perspective in place that led to the current state of the Turkish automotive industry. Rather, the automotive firms that performed well in recent decades did so thanks to their organizational capabilities and experience in international competition. The analysis on the export patterns shows that Turkey's place in the international division of labor has been determined by the decisions of multinational firms. Motor vehicles manufacturers in Turkey were able to readjust their positions vis-à-vis the European value chains by skillfully managing the benefits of geography (proximity to the European markets) and the country's metalworking capability. However, existing tax policies that heavily rely on indirect taxes have created significant obstacles for automotive firms, which in principle can move their production and R&D activities in Turkey towards high quality/high value added segments of the industry.

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1. Introduction

The industrialists, as an interest group heavily influenced the trade and industrial policymaking process in Turkey since the 1970s. Even after the country decided to move from an import-substituting strategy towards an export-oriented growth strategy in 1980, key import-competing sectors were able to slow down the trade liberalization process using their influences on policymakers.

The Customs Union (CU) agreement between Turkey and the EU that went into effect in 1996 was a critical turning point in Turkish policymaking process. The CU agreement limited the power of domestic interest groups in influencing the trade policymaking process by committing the government to trade liberalization vis-à-vis the EU members. As such, the CU forced the Turkish industry to undertake productivity enhancing investments in the late 1990s, which would enable them to compete with imports from the EU. When the 2001 financial crisis hit the domestic markets hard, Turkish exporters were ready to switch their focus to export markets, and especially to European markets.

Turkish aspirations to become a member of the EU went back to the 1950s. According to the 1963 Ankara Agreement, the two sides were expected to form a CU in the 1990s. The European side had already removed all tariff barriers against Turkish manufactured products before the 1990s. In order to signal its good intentions in abiding by the spirit of Ankara Agreement, at a time when the European side expected Turkey to improve its democracy and a free trade agreement between the two sides would suffice to deepen the economic ties, Turkey decided to go ahead with the CU.

In this study, we analyse the industrial and trade policymaking process in relation with its impact on automotive industry.[3] There are good reasons to choose the automotive industry for this study. It has been a showcase of import-substituting policies in Turkey since the late 1960s. Turkish automotive companies were jointly owned and managed by domestic investors and multinational corporations (MNCs). Protected behind high tariff walls for at least three decades since the mid-1960s, these companies had undertaken production with old/outdated technology transferred from other factories of MNCs to produce low-quality products domestically. As long as the quota and tariff protection continued, these joint ventures were bound to make profits.

In the negotiation stage of the CU agreement, automotive industry was expected to be one of the industries to get seriously affected from the CU. However, since the CU went into effect in 1996, the automotive industry has become one of the most vibrant sectors of the Turkish economy.

The successful development of the Turkish automotive industry since mid-1990s is a product of several factors that are not necessarily connected. First of all, the import substituting policies from the 1960s to 1980s provided the industry with a rather long period during which it was protected from import competition. Furthermore, protection from import competition went on, albeit with a downward trend, even after the country started its trade liberalization in the 1980s. It was not only the owners of the main motor vehicles producers who benefited from the government policies, but also parts and accessories manufacturers, employees, and the distributors of the sector were

[3] Hereafter, "automotive industry" refers to motor vehicles (ISIC 3410); automobile bodies, trailers, and semi-trailers (ISIC 3420); and parts/accessories for automobiles (ISIC 3430) based on International Standard Industrial Classification (ISIC), Revision 3.

among the beneficiaries. The long period of protection from imports helped these groups achieve higher levels of income relative to their counterparts in other industries but at the same time accumulate substantial knowledge and experience in the sector. This learning process had later proven to be critical for the industry to carry on in the face of macroeconomic uncertainty and increased import competition in the 1990s.

When the industry was forced to compete with imports, it showed great resistance. However, it succeeded in making good use of the transition period that was provided by the CU decision. As a result, the CU decision enabled the successful integration of the industry within the global value chains. Furthermore, in the absence of a sizeable domestic production in high-tech industries, the increased competitiveness of automotive firms provides opportunity to develop know-how and skills in medium-high technology production processes.

Along with its successful integration with the global auto value chains the Turkish automotive sector has taken the government's R&D policy seriously. As a result, major automotive and parts & components manufacturers invested in new R&D centres. Yet, their R&D efforts are still very meager and a success in the R&D field requires many more years of experience and other factors in place such as the availability of well-educated engineers and specialists.

Government policies continue to hinder the growth of the industry.
The current tax system with its heavy reliance on indirect taxes presents the main challenge for the industry. The tax system forces the automotive firms to focus their production on automobiles with smaller engine powers as well as light commercial vehicles (LCVs), both of which requires much less R&D investment compared to the cars at the higher end of the market.

In order to provide information about the Turkish automotive industry as well as the institutional background, we start the analysis with a detailed account of the history of the industry and the industrial and trade policy implementation in Turkey. Then we show how the industry successfully overcame the challenges introduced with the CU decision. Rather than just focusing on the immediate aftermath of the CU decision, we focus on the structural transformation of the industry throughout the 2000s. Finally, we delve into a discussion of the potential threats, challenges and opportunities facing the industry. In particular, we discuss how the current R&D policy enhances investment in the sector, while at the same time, how the current tax policy forces the industry to specialize in the lower segment of the market, which turn may reduce the future investment potential of the industry, both in production and R&D facilities.

2. Industrial and Trade Policies and the Automotive Industry

2.1. Import Substituting Industrialization (1960s and 1970s)

Turkish automotive industry dates back to 1950s. Initially, the industry focused on the production of tractors, followed by heavy and light commercial vehicles to satisfy the demands of the state and private sector. The first tractor plant, Turk Tractor, went into operation in 1954.

Domestic automotive production got a serious push from the implementation of the First Five Year Development Plan (FYDP) between 1963-1967. The Plan foresaw a growth rate of 12.9 per cent per annum for the industry. Consistent with this ambitious growth target, the Plan also set forth the principles of import substitution policies to develop domestic industry. There was specific reference in the Plan to the locomotive role of the automotive industry in the industrialization process (See Yucel, 2015, p. 58).

Under the guidance of the Plan, major bus and truck plants were established from 1963 to 1968 (Otokar in 1963, A.I.O.S., BMC, Karsan and MAN in 1966 and Mercedes Benz in 1968). The domestic automobile production started in the second half of 1960s with a meager capacity. After an unsuccessful attempt by the State Railways to commercially produce a domestic car named "Devrim" in 1961, Ford Otosan undertook a similar attempt in 1966 and started producing a domestic car called "Anadol", and made it a commercially successful brand.

While encouraging private sector to produce domestic cars, trucks and buses, the government wanted to make sure that these plants that were mainly assembling final products from imported bodies, engines, and other parts would increase the domestic content of their products. Otherwise, the high current account deficit problem could not be resolved.

As part of its efforts to reduce dependence on imported materials, the government issued the "Assembly Industry Order" in April 1964. The Order's main objective was to increase the use of domestic parts and intermediate products in the production of final products. The Order did not impose the production of all products domestically. Rather it foresaw the beginning of the domestic assembly of major final products from imported as well as domestic inputs. Consistent with this objective, it provided detailed lists of parts and intermediate materials that were to be produced domestically or imported. The Order covered products such as refrigerators, washing machines, trucks, tractors, buses and automobiles. It also made it imperative for the producers to increase the domestic content over time.

The first three development plans were implemented in the period from 1963 to 1977. The policies implemented were successful in generating rapid growth. Over this period, the industrial output growth reached 9.5 per cent per annum, while the average growth rate for the whole economy was 6.5 per cent per annum. During this period, private sector investment and hence the production capacity in textiles and apparel, food and consumer durable goods industry increased significantly.

The second FYDP of 1968-1972 was also critical in the creation of an environment for the development of the automotive industry. Unlike the first development plan of 1962-1967 that aimed at the balanced growth of agriculture and industry, the second plan of 1968-72 specifically gave priority to the industry. While the state was specifically given the lead in investment and intermediate goods industries, private sector was encouraged to invest in consumer goods sectors. Furthermore, the Plan made sure that the newly established industries would be protected from foreign competition until they attain a minimum level of competitiveness that would help them stand against foreign competition.

In addition, the second FYDP provided impetus to the urbanization process, which would in effect improve both the supply and demand conditions for the fragile domestic industry. Rapidly increasing population of the urban areas would increase the supply of labour for the rapidly growing industry. In addition, rapid urbanization would increase the demand for the flourishing consumer durable good industries.

During the implementation of the second FYDP, TOFAŞ and OYAK Renault automobile plants started their production in 1971. Compared to commercial vehicle plants that started their operations in the 1960s, the two automobile plants involved larger production scales. While less than 4000 cars produced in 1970, within five years automobile production jumped to 72 thousand units in 1975.

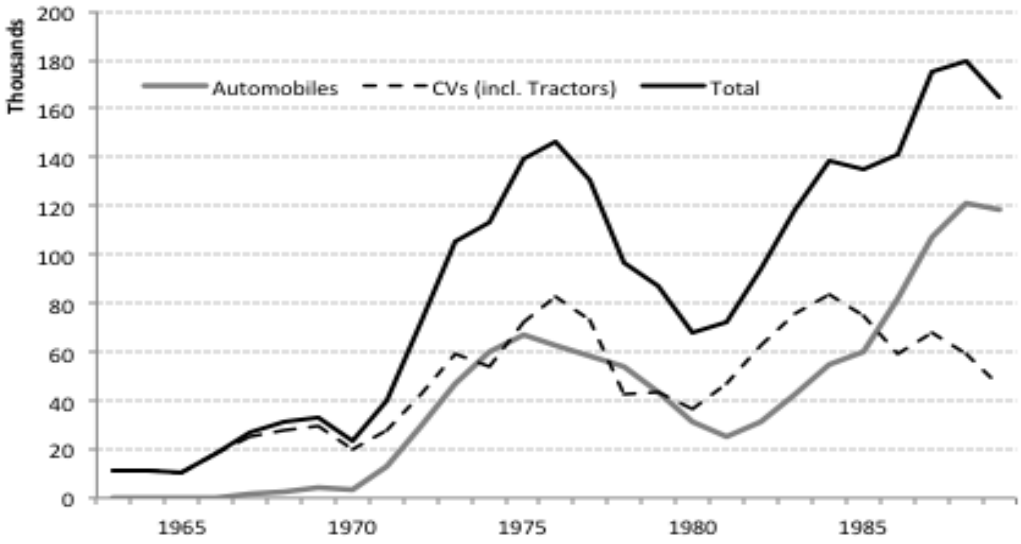
The timing of the assembly plant investments was perfect: Early 1970s had proven to be an important turning point for the industry, as the demand for cars swelled along with the urban middle-income population. In the first half of the 1970s, production of tractors, trucks and light commercial vehicles also gained momentum. As a result, the total production increased from 23 thousand in 1970 to reach its peak of 146 thousand units in 1976. Approximately 43 per cent of the 1976 production was accounted by cars, 32 per cent by commercial vehicles and 25 per cent by tractors (see Figure 1).

Private sector investment in the 1960s focused mostly on small-scale investments, undertaking of which would not create heavy burden on the trade balance. However, as both the public and private sector investments grew over time, they imposed a heavier burden on the trade balance. That is why the import substitution policies in effect in the 1970s were more advanced versions of the import substitution policies that were in effect in the 1960s.

The industrial policies of the 1960s and 1970s included both vertically discriminating and non-discriminating aspects with respect to industrial sectors. Unlike the successful industrial policies of S. Korea, Thailand and other South East Asian countries, the industrial policies of the planned era were not conditional on firms' ability to reach specific targets determined by the state. (Turel, 2007.) Actually, the technocrats in the government that was briefly in power after the 1960 coup wanted economic plans to include binding targets not only for the public sector, but also for the private sector. As a result, the private sector would have to achieve specific targets in order to enjoy the benefits of the industrial and import-substituting trade policies. However, the centre-right parties that came to power in the second half of 1960s and throughout the 1970s did not want to follow policies that they viewed as against the market principles. Furthermore, while both politicians and bureaucrats favoured the use of protectionist trade policies to prevent the worsening of the trade balance, until 1980s they never thought of providing export incentives to improve the trade balance.

As an industry that requires integrated production of the final product, automotive industry had played a locomotive role in the development of other major manufacturing industries. Automotive manufacturing involved casting, forging, metal removing, sheet-iron bending and cutting, upholstery, painting, and serial production techniques. As a result, it had direct backward linkages with many industries. At the same time, import substituting policies and the industrial policies of the 1960s and 1970s (the so-called "assembly industry order") were instrumental in the development of auto parts industry along with the main automotive plants. The first half of 1970s was also important for the development of the industry, in that the rapid success of domestic assembly plants led to the increased investment in auto part plants mostly in the Marmara region.

Figure 1: Automotive Industry Production (1963–1989, thousand units)



Source: TurkStat

The surge in car demand was taking place in the midst of rapid hikes in the global oil prices. The governments of the time decided not to reflect the world oil price increases in the domestic market, which helped kept the number of cars sold high. The industry's robust growth could not last very long. Both demand and supply side troubles that affected the Turkish economy in the late 1970s also hampered the prospects of the automotive industry. First, the government's decision not to increase domestic gasoline prices in the face of increasing global oil prices led to a substantial increase in both the trade deficit as well as the government budget deficit. The rapidly emerging twin deficits finally led to the balance of payments crisis in 1979.

At the same time, in the supply side, the industry suffered from significant workday losses due to the intensification of politically motivated union activity and strikes. As domestic industrial production increased throughout the 1960s and 1970s, labour union membership increased substantially. In the politically charged environment of the second half of 1970s unions started using their power and organized stops to increase real wages. Automotive industry suffered significantly from the resulting working day losses.

As a result of these demand and supply-side shocks, total production in the sector, that reached as high as 146,000 units in 1976, dropped by more than fifty per cent to 68 thousand in 1980 (See Figure 1). But it was not only the automotive industry that was suffering. The whole economy went into disarray. GDP contracted in both 1979 and 1980. Inflation increased above 20 per cent. The political atmosphere was worsening even faster than the economic performance. The extreme right- and left-wing political opponents were in the brink of a civil war. The political and economic spiral could not last very long.

2.2. Export-Oriented Policies of 1980s and 1990s

1980 was the year of change in economic and political spheres. On 24 January 1980, the Demirel government announced a new macroeconomic stabilization package, which also carried the roots of liberal economic policies. Turkey finally decided to take the route that had been suggested by the IMF and the World Bank in late 1970s and abandoned already failed import-substituting policies of the 1960s and 1970s with what was called the export-oriented growth strategy. Even though the macroeconomic stabilization package included a set of policy actions in the right direction, in the prevailing political atmosphere its successful implementation was almost impossible. The drastic changes in the political scene that were to take place before the end of the year changed the prospects of the 24 January economic measures.

On 12 September 1980, blaming the political and economic instability and the state of anarchy in the country, top generals of the military overthrew the democratically elected government and took the power. The military takeover had changed the scene dramatically. The military supported the economic policies of the Demirel government. Turgut Ozal, who was the brainpower behind the 24 January stabilization package, was appointed as the minister in charge of the economic affairs. These developments ensured not only the implementation of the macroeconomic stabilization package, but also the new export-oriented growth strategy.

Exported-oriented growth strategy stood up on two main pillars. The first and more urgent one was to provide subsidies to domestic producers to direct them towards selling their products in international markets. Without increasing exports it was impossible to keep the trade balance under control. The second pillar of the export-oriented growth strategy was to gradually liberalize imports, which involves easing quantitative restrictions and lowering tariffs. In theory, as domestic producers face more competition from imports they will be forced to improve their productivity and upgrade their products in order to survive.

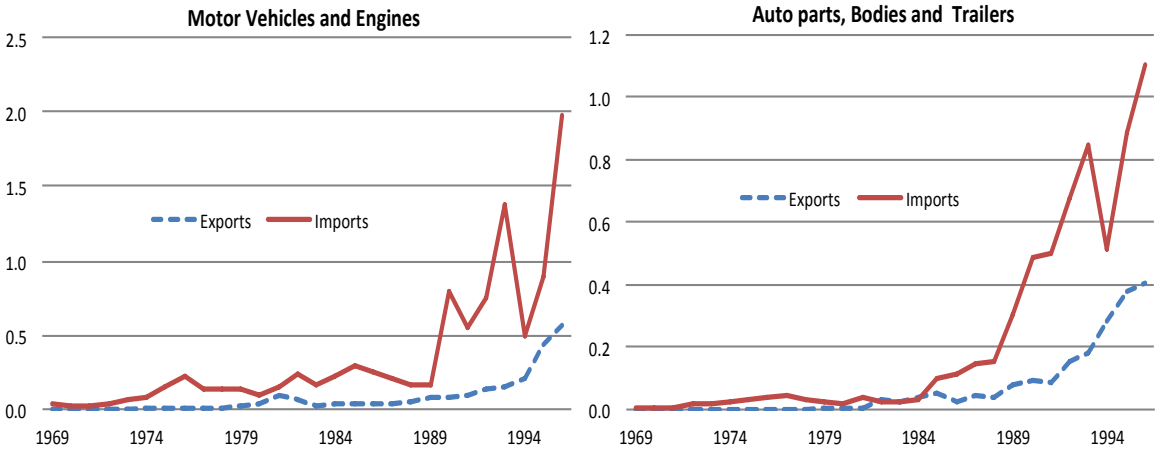
1980 was an important turning point in terms of the basic principles and the conduct of the trade and industrial policies. As the overall economic policy framework switched from import-substituting industrialization towards the export-oriented growth strategy in the early 1980s, there was a major switch in the implementation of industrial policies as well. While in the import-substituting era industrial policies were implemented in a vertical fashion across industries, under the export-oriented growth era industrial policies were implemented in a horizontal fashion. Instead of providing incentives to a select group of sectors, sub-sectors or firms, the industrial policies of the post-1980 provided incentives for activities or characteristics of firms that may be observed horizontally in all sectors. Among the policies of the post-1980 one can count investment subsidies provided to small and medium enterprises, or to all firms that undertake research and development. (Turel, 2007.)

In the early years of the strategy (1980–1983) exports were encouraged through various direct and indirect measures such as export tax rebates, preferential export credits, foreign exchange allocations and the duty-free access to imports. During this period, the total subsidy rate (which incorporates tax rebates, preferential credit, and foreign exchange allocation for duty-free imports) received by manufactured goods exporters reached 20–23 per cent of export value (Milanovic 1986).

Elimination of import barriers gained momentum after 1984. First, quantitative restrictions were rapidly phased out, and for a large number of imported goods were allowed without any prior permission (Togan 1994). Second, there were significant reductions in tariff rates, especially on imports of intermediate and capital goods in the late 1980s and early 1990s. Though tariffs on certain goods (for example, consumer durables) were increased temporarily after the elimination

of quantitative restrictions, this did not lead to an increase in overall nominal protection rates, because imports of the goods in these categories were severely restricted before 1984. From a level of 76.9 per cent in 1984, the output-weighted average nominal tariff rate for the manufacturing industry declined to 40 per cent in 1990 and to 20.7 per cent in 1994.

Figure 2: Exports and Imports of Automotive Subsectors (bn US$, 1969–1996)



Source: TurkStat

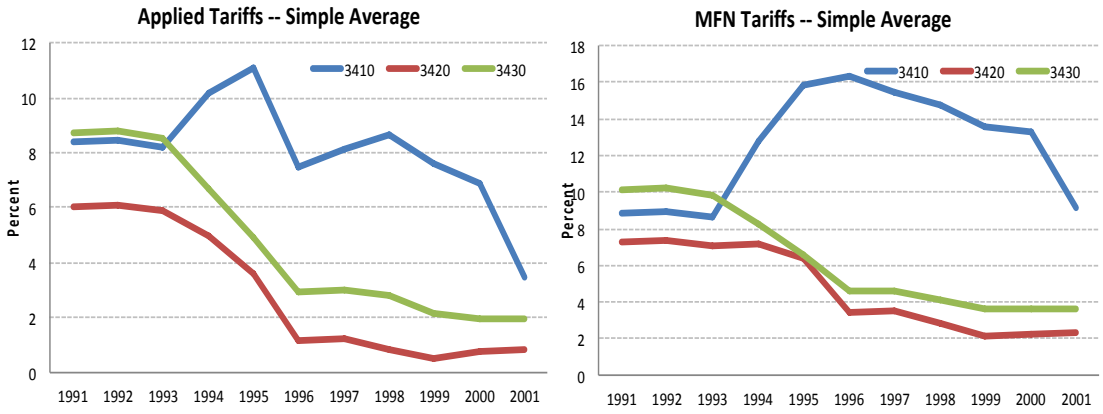
Until 1984, imports of motor vehicles and engines amounted to less than $250 million a year. With the liberalization efforts affecting the sector very little, between 1984 and 1989 imports of motor vehicles and engines fluctuated between $160 and $290 million (Figure 2). Imports of automotive parts and components also stayed very low (less than $50 million) for a very long period before 1984. From 1984 to 1989, it steadily increased to $300 million. Compared to imports today these import figures amount to nothing, but when we consider that for most of 1980s the country's total exports was less than $10 billion and total automotive exports in 1990 was only $174 million, the steadily increasing automotive imports could be a cause for concern for the government.

As part of the trade liberalization efforts that started in the first half of 1980s and in preparation towards the CU agreement with the EU, Turkish government started gradually lowering tariffs on auto imports in 1989. As a result, from 1989 onwards, there was a more significant increase in the imports of cars and trucks and their components in the 1990s, from $463 million in 1989 to $2.2 billion in 1993. After a correction during the 1994 crisis, total automotive imports increased to 3.1 billion by 1996. Over the period, however, motor vehicle and engine imports increased faster. While in 1989 parts and components imports accounted for 2/3 of the total industry imports, their share fell down to 1/3 by1996.[4]

4 It is interesting to observe that the policy makers in Turkey expected that, in spite of the decline in tariffs, motor vehicle imports would remain stable, whereas the share of parts and components imports would increase in the 1990-94 period as a result of increasing domestic production (SPO, 1989: 243). Apparently, as a result of the rapid increase in the imports of motor vehicles, the policy makers were forced to increase tariffs for motor vehicles in 1994 and 1995.

As our 4-digit ISIC sector tariff data starts in 1991 we cannot show that the tariffs on motor vehicles (with ISIC sector code 3410) went down more than the ones of parts and components (Figure 3). However, the fact that imports of motor vehicles increased much more than that of the imports of parts and components provides us indirect evidence to claim that it was indeed the case. Applied and MFN (Most Favoured Nation) simple average of tariff rates for automotive parts and components (indicated by sector codes 3420 and 3430) were lowered significantly from 1993 to 1996, whereas simple average of tariff rates on imports of motor vehicles were increased several percentage points in preparation to the CU.

Figure 3: Applied and MFN Tariffs on Automotive Imports (percent, 1991–2001)



Source: The World Bank

The divergence between the tariffs facing motor vehicle imports and those facing the imports of parts and components reveals that the government actually increased the effective rate of protection enjoyed by the motor vehicles manufacturers. The increase in the average tariff rate facing the final product imports combined with a reduction in the tariff facing the parts and components imports effectively raise the value added in domestic prices further above the value added in foreign prices. Despite this fact, however, motor vehicles and engine imports increased in 1995 and 1996. Perhaps, the increase in motor vehicles imports could have been much higher had the government decided to keep the average tariff rates on motor vehicle imports in their 1991-1993 levels.

The increase in automotive imports in the first half of 1990s forced the automotive manufacturers to undertake new investments to lower costs of production as well to improve the quality of their products. For almost a decade, the industry's total investment fluctuated within a band without any sign of upward movement. However, as the imports started to pick up from 1989 onwards, the industry's investment expenditures increased significantly from around 300 million TL (in 1990 constant prices) in 1989 to 1.2 bn. TL in 1991 and stayed high until 1993. Most of these investments were in the form of machinery and equipment investments, nearly half of which was spent on imported machinery and equipment

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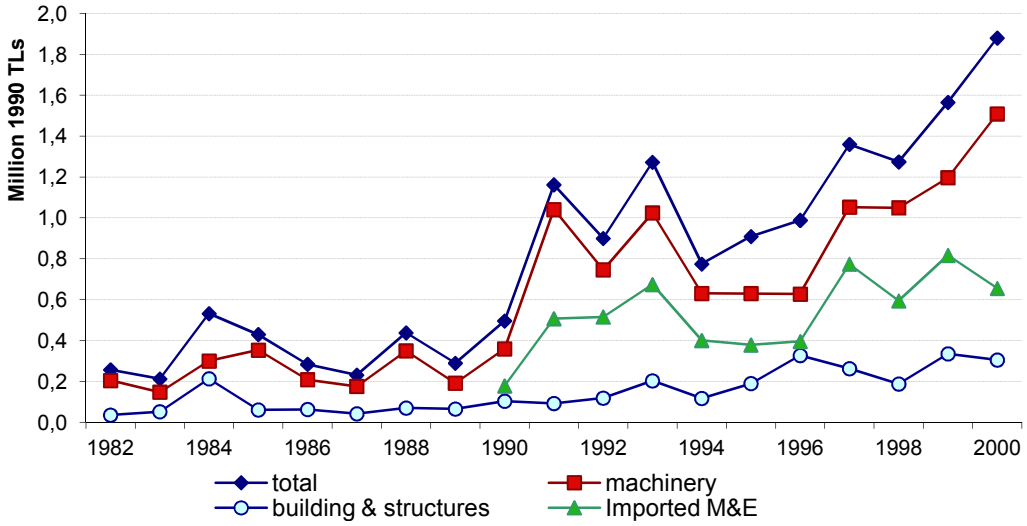
The industry's resilience during the turbulent decade of the 1990s and resistance against imports could be explained by the sensitivity of consumers to repair and maintenance costs. The networks of dealers and after-sales services established by domestic producers have been instrumental for protecting their market shares.

Figure 4: Investment in the Automotive Industry
(based on Annual Survey of Manufacturing Establishments (ASMI) by TurkStat)

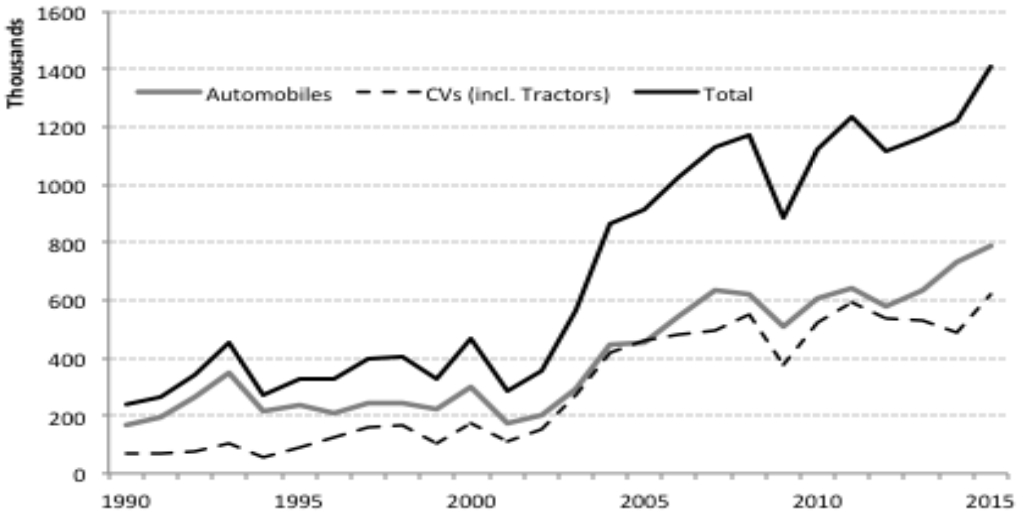


Source: Authors' calculations using ASMI conducted by TurkStat.

The quality improvements in return helped a slight increase in the exports of domestically produced cars and light-commercial vehicles in the first half of 1990s to surpass $500 million mark by 1996. Exports of parts and components also increased throughout 1990s, reaching $400 million by 1996. Despite the steady increase in exports, the trade deficit for the industry reached an all time high figure, $2.1 billion (Figure 2).

Along with the steadily increasing imports, total production of the industry more than doubled from 146 thousand in 1989 to 453 thousand in 1993 (Figure 5). The sector was able to increase the production so quickly by both increasing the installed capacity from 340 thousand in 1989 to 590 thousand in 1993 and increasing the capacity utilization rate from 48 per cent in 1989 to 77 per cent in 1993.

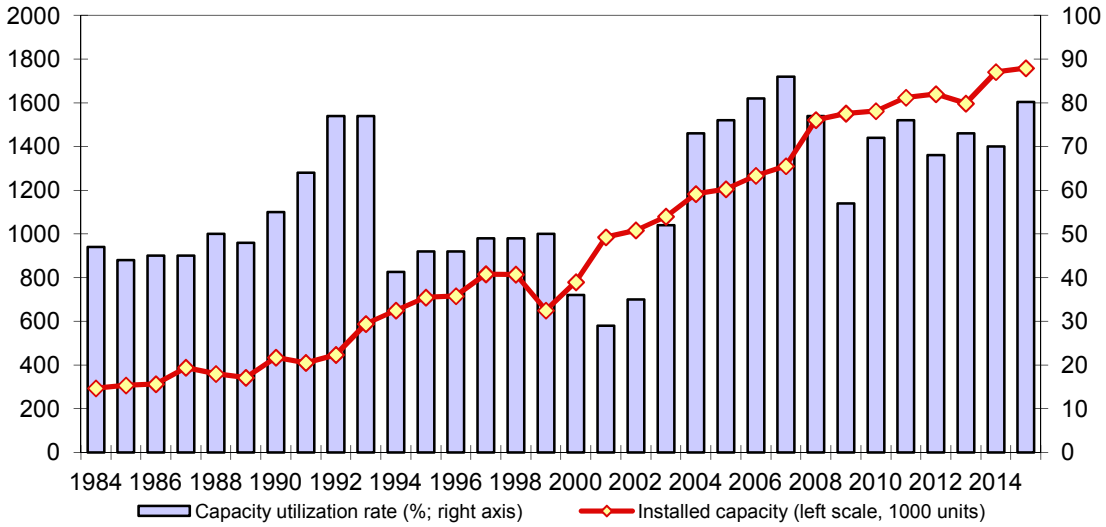
Figure 5: Automotive Industry Production
(1990–2015, thousand units)



Source: TurkStat

However, the 1994 crisis had its toll on the domestic car industry. Domestic production of motor vehicles dropped by 41 per cent from 1993 to 1994. In spite of the 1994 crisis, the industry was able to attract FDI, perhaps thanks to the Turkish aspirations to become a member of the EU and the finalization of the CU agreement. Multinational firms that hitherto stayed away from undertaking production in Turkey established new plants: Toyota in 1994, Honda and Hyundai Assan in 1997. These were all small plants by international standards, with a capacity ranging from 20,000 to 50,000 units per year. Indeed, this has been the most preferred method of inward FDI flows in the Turkish automotive industry as well as the whole manufacturing. All these plants were established as joint ventures with local companies. Due to the presence of heavy bureaucracy, which was biased towards the protection of domestic firms, multinationals in automotive and other industries chose to take a domestic partner who would be politically strong enough to minimize bureaucratic barriers to entry.

Figure 6. Installed Production Capacity and its Utilization



Source: Automotive Manufacturers' Association (OSD)

Foreign affiliates that had been operating in Turkey increased their production capacity, by establishing new plants (for example, Ford in 2001) or by expanding the existing ones (Toyota and Hyundai Assan). As a result, the production capacity continued to increase to reach 815 thousand in 1998. Despite the investments in the sector, however, the increasing macroeconomic and political uncertainty and increased import competition between the 1994 and 2001 crises kept the domestic motor vehicles production fluctuating within a band of 300 and 450 thousand units. The capacity utilization rate stayed below 50 per cent throughout the rest of 1990s and early 2000s (Figures 5 and 6).

3. The Customs Union with the EU and Impact on Automotive Industry

It was not specific industrial policy measures but rather the CU decision with the EU that forced domestic producers to fully integrate their production units with the global automotive supply chains in the period from 1996 to 2004. As a result, during this period Turkish automotive industry emerged as an industry that could sustain its global competitiveness.

The CU put an end to the heavily protected domestic auto market and forced the auto industry firms to undertake investments. While the industry started to invest in new production facilities first and R&D later, the government and the bureaucracy had to learn to help the auto industry as

well as other sectors with more subtle means such as anti-dumping duties, technical standards, and industrial policy measures.

The agreement to form a CU between Turkey and the EU was signed in March 1995, but its history goes back to September 1963, when the institutions of the EU-Turkey Association Council were established by the Association Agreement, signed in Ankara (also called the 'Ankara Agreement'). Being the final phase of this process, the CU agreement involved critical trade policy actions from the Turkish side as the EU had already eliminated tariffs on Turkish imports in the first two phases. By signing the CU agreement, Turkey agreed to completely remove tariffs on EU manufacturing imports. Turkey agreed to impose the common external tariffs of the EU against third countries. The EU, in turn, agreed to eliminate quotas facing Turkish exporters of textiles and clothing.

The CU had more serious implications for Turkey compared to other forms of associations such as Free Trade Agreements (FTA) or Preferential Trade Agreements (PTA). As Turkey's EU membership process continues, it is expected to include service sectors as well as public procurement and agriculture. As such, the CU also entailed the harmonisation of competition policies with those of the EU. The CU agreement required Turkey to adopt EU competition rules before the agreement went into effect in 1996. As part of the efforts to prepare for the CU, the Turkish parliament passed the competition law in 1994, which also established the Competition Authority. The CU entailed the harmonisation of the Turkish sectoral and regional incentives with that of the EU. Finally, the CU required Turkey to be more proactive in the protection of intellectual and industrial property rights.

Following the implementation of the CU, Turkish tariff rates on imports from the EU declined from 10.2 per cent in 1994 to 1.34 per cent in 2001. The tariff rates on imports from FTA partners of the EU declined even more dramatically, from 22 per cent to 1.34 per cent (Togan 2000). As a result of these cuts, the tariff rates applied by Turkey on industrial imports from the members of the World Trade Organisation were the lowest among countries at the same level of development as Turkey. Interestingly, Turkey's weighted and simple average tariff rates on industrial imports are substantially lower compared to tariffs in countries that joined the EU after the CU (Kaminsky and Ng 2007).

With its March 1995 decision to sign the CU with the EU, the Turkish government forced domestic industry to confront further competition from European imports in the second half of 1990s. Before the CU went into effect there was some visible and less visible opposition in Turkey to its implementation. There was visible opposition from the labour unions, which claimed that as a result of the increased competition from imports the CU would lead to job losses in many sectors. However, as the labour laws that were enacted after the 1980 coup weakened the political power of the labour unions, the opposition from the unions did not really have a significant impact on the negotiations.

As one of the more sensitive sectors, the automotive industry lobbied forcefully against the CU prior to 1995. Once they realized that there was no way they could block the agreement, they argued that the industry should be provided breathing space before the CU agreement was implemented in the sector. As a result, the Turkish government listed the industry as one of sensitive sectors, which enabled it to provide the industry a 5–year transition period during which the tariffs of imports from third countries would be significantly higher than the EU average customs tariffs on cars imported from third countries (which was fixed at 10 per cent). While the Turkish tariffs on car imports from third countries were between 26.8-33 per cent in 1996, 10 per cent of the applied tariffs were lowered to the level of European Common Customs Tariffs in 1997, bringing down the range of tariffs to 25.1-30.7 per cent in 1997. The whole automotive product import tariffs were subject to a gradual decline such that the 10 per cent of the tariff lines reduced

to the EU average in 1997 were followed by another 10 per cent in 1998, and 15 per cent in 1999 and in 2000. Finally the remaining 50 per cent of the tariffs were reduced to the EU common external tariff in 2001. (Alpay 1995, s. 9)

In addition, and perhaps more importantly, the Turkish government also secured the approval of the EU side to block imports of used cars from EU for 10 years. At the time, the industry representatives feared that Turkey would have become a heaven for second hand car imports from the EU. This decision was very critical in avoiding a major threat for the sustainability of the industry immediately after the CU.

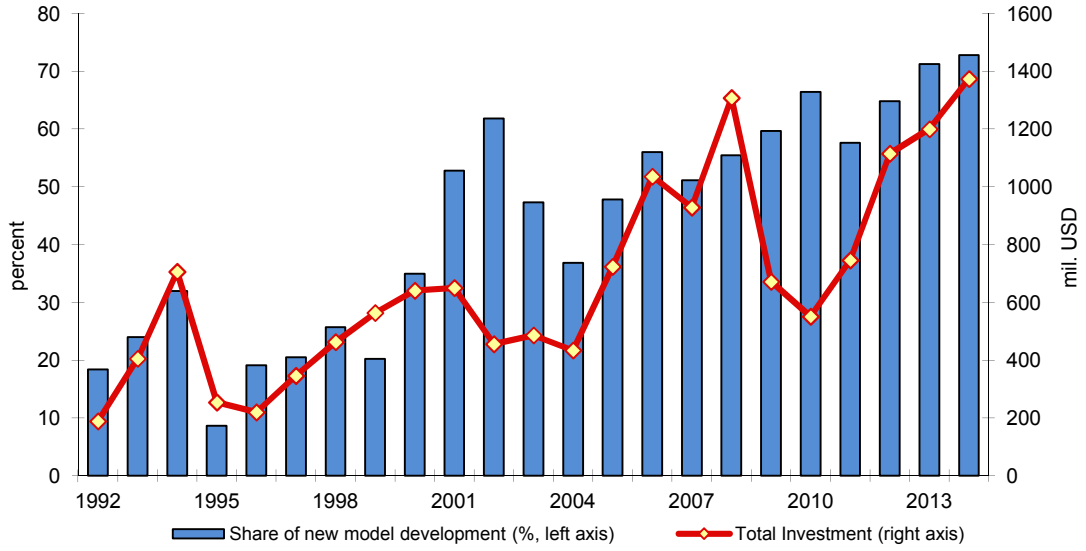
Finally, the sharp depreciation of the TL during the 1994 economic crisis was quite instrumental in keeping the increase in imports under control as the CU went into effect in 1996. As of the end of 1995, the real exchange rate was 18 per cent below its level as of the end of 1993. As a result, even though it would appear that the tariff cuts on products from the EU could lead to an increased demand for imports, an undervalued TL curtailed this increase.

The fact that tariff cuts had gradually started as early as 1989 allowed auto industry time and space to prepare itself for the competition from imports. Starting from 1989 onwards, the industry started introducing slightly better quality models compared to what they were producing in the 1980s. Yet, these models were not as good as the European car models and hence could not be exported to Europe. Nevertheless, domestic manufacturers introduced these models in order to compete with the more-expensive and higher-quality imports.

Once the CU went into effect, however, the expected reduction in tariffs was drastic. As a result, the Turkish auto industry could not rely on the models they introduced in the first half of 1990s to compete with high quality cars imported with very low external tariffs. A new round of investments were to take place in the industry. As can be seen in Figure 4, total investments in the industry almost doubled in four years time from 1996 to 2000.

A similar picture emerges when we look at the data collected by OSD from its members. The total investment of the motor vehicle manufacturers went up from $220 million in 1996 to $650 million in 2001. The share of the investment that went to new model development increased significantly from 20 per cent in 1996 to more than 50 per cent in 2001. The industry's total investments (in US$) declined once the main manufacturers developed new models in late 1990s and early 2000 and start exporting them following the collapse of the Turkish economy and the Lira during the 2001 economic crisis. However, even then the share of new model development in total investment expenditures continued to stay above 50 per cent.

Figure 7: Investment in the Automotive Industry



Source: Automotive Manufacturers' Association

As a result of 'forced' investments, Turkish auto industry has successfully integrated to the global automotive industry supply chain. At the moment it is the number one export industry in Turkey. Furthermore, thanks to its half-a-century long production experience the sector has been well placed with successful ventures in both the automobiles/commercial vehicles and the auto-parts segments.

As emphasised by Kaminski and Ng (2007), the CU changed the Turkish trade policy framework completely by bringing in predictability, transparency and stability as well as liberalising market access for both preferential and MFN suppliers. As a result of the CU, contestability in the Turkish markets for industrial and agricultural goods increased substantially. The increased contestability and competition, in turn, forced domestic producers to be better prepared to undertake productivity enhancing investment.

As the tariff rates on imports were brought down substantially, imports from the EU and total imports were expected to increase and this was actually what happened in the first couple of years. Imports increased from $35.7 billion in 1995 to $54.5 billion in 2000. Over the same period imports from the EU increased from $23.7 billion to $28.5 billion. The increase in total imports translated into an increase in the import penetration rate from 22.2 per cent in 1995 to 27.8 per cent in 1996 and to almost 29.6 per cent in 2000. The increase in the overall import penetration rate within five years was mostly a result of the CU itself.

The EU had been Turkey's most important trade partner before 1996 and it stayed so for some time after. However, its share in Turkish imports has declined over time and especially after China became a WTO member in 2001 and entered as a major player into the world export markets. To be more specific, the share of imports from the EU has declined from 56 per cent in 1996 to 52 per cent in 2000 and further to 36.9 per cent in 2008. After hitting a minimum value of 36.7 per cent in 2013 and 2014, the EU's share in Turkish imports slightly increased to 38 per cent in 2015. Turkish imports from China and the other East Asian countries increased rapidly in the 2000s. From 2.2 per cent in 2001, the Chinese share in Turkish imports had risen to 9.2 per cent by 2010 and 12 per cent in 2015.

The CU agreement with the EU did not have a significant impact on Turkish exports in the first five years. The compounded annual growth rate of exports between 1996 and 2001 was 6.2 per cent compared to a 14.3 per cent growth rate between 1980 and 1995. One of the reasons was that the EU had already removed tariffs on Turkish goods before the CU. In addition, despite the CU, the EU continued to reserve the right to impose antidumping duties on Turkish exports to the EU as well as keeping technical (regulation) barriers (Togan et al 2005). Coupled with the appreciation of the Turkish lira, it is therefore not surprising that Turkish exports to the EU did not experience a serious surge immediately.

The positive impact of the CU on Turkish exports was realised after a long delay, and only after the 2001 crisis. The depreciation of the Turkish Lira and the contraction in domestic demand that followed the economic crisis of February 2001 forced domestic producers to search for export markets. Export revenues increased 12.6 per cent in 2001. Exports grew faster in 2002 and 2003, even after the domestic demand resumed its growth. Better-than-expected export performance in 2002 and 2003 was achieved despite a 25 per cent real appreciation of the Turkish Lira during this period, in part thanks to the appreciation of the Euro against the Dollar.

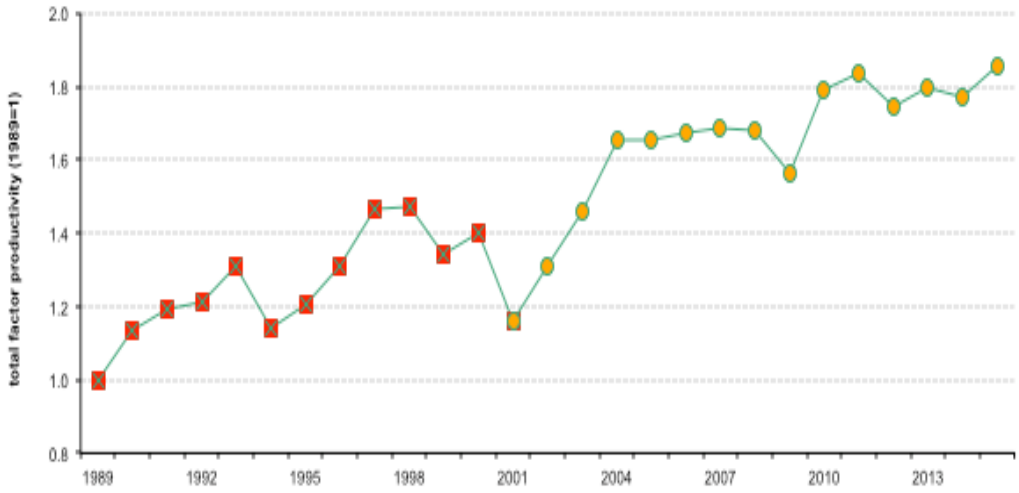
The CU helped further open up the Turkish economy to international competition, and trade figures show the changes in the structure of Turkey's foreign trade after the CU. The track record of the Turkish manufacturing industry in response to the CU has been better than initially expected, especially when one considers that Turkey received very little financial support from the EU to help ease the adjustment burden; in fact, from 1996 to 2000, Turkish industry proved that it had the capacity to cope with competitive pressure from imports. Since 2001, it has become apparent that the transformation of the Turkish industry following the CU helped it prepare itself for even more formidable competitors such as China and other East Asian countries.

The increased competition from imports led to important changes in the behaviour of domestic producers of manufactured goods. Before the CU, some sectors such as the automotive, durable home appliances, electrical machinery and basic metals had continued to receive protection behind high tariff barriers despite the import liberalisation process that had started a decade ago. However, productivity growth in these and other import-competing sectors was higher compared to export-oriented and non-traded goods sectors (see Özler and Yılmaz 2009).

Taymaz and Yılmaz (2007) have also shown that the total factor productivity in manufacturing industry as a whole did not increase much between 1996 and 2000, but increased substantially in those sectors that experienced significant increases in import penetration rates after the CU. This effect was statistically significant even after other variables such as the real exchange rate, the export-output ratio, as well as time variables (time trend or time dummies) were included as explanatory variables for the plant-level total factor productivity.

The increase in production and exports of the automotive industry went hand in hand with solid improvements in productivity. From 1989 to 1994, total factor productivity growth in the automotive industry was 7.7 per cent per annum (Figure 8). Following the 16.5 per cent drop during the 1994 crisis, total factor productivity recovered in the period from 1994 to 1997 to a growth rate of 8 per cent per annum. However, the slowdown in the economy due to the Russian crisis in 1998, the devastating Marmara earthquake in 1999 and the 2001 led to a serious decline in the total factor productivity. Almost all improvements in the industry's total factor productivity reversed by the end of 2001. From the 2001 crisis to 2004, the industry's labor productivity grew by 16.5 per cent per annum (Figure 8).

Figure 8. Automotive Industry -- Total Factor Productivity (1989-2000; 2001-2015) [5]



Source: Authors' calculations using ASMI data and labor productivity index.

While the automotive industry was successful in riding the CU tide, differences in the characteristics of its subsectors have led to a divergence in their performances since 2005. The motor vehicles industry has been dominated by multinational corporations, and seized the opportunities opened up by the CU by investing in new product and process technology and learning. The auto parts and components sector, on the other hand, has been dominated by smaller domestic firms, and the majority of these smaller firms have not been integrated with the global value chains.

Focusing on the trends in the manufacturing industry as a whole, the CU drove the transformation of the Turkish industry towards higher productivity faster than it would have otherwise experienced. Most of the productivity gains due to increased competition from the EU were realized until the early 2000s. After 2003, the EU's share in Turkish imports has been decreasing steadily, while the share of the East Asian countries and especially China have been on the rise. The productivity gains that have been accrued since 2003 are in part due to those sectors that faced increased competition from China.

Turkish manufacturing industry achieved higher productivity growth through increased reliance on intermediate input imports from East Asian countries and especially from China (Yükseler and Türkan, 2006). While Turkey has conducted approximately 50 per cent of its export transactions with the euro, the euro's share in import transactions is less than 35 per cent. The appreciation of the euro against the dollar after 2002 enabled Turkish exporters to rely more and more on imported inputs from China and other Asian economies in their quest to keep their production costs under control.

[5] Total factor productivity for the 1989–2001 period was calculated using Olley-Pakes. TFPG series were imputed for 2001–15 by using the index for labor productivity.

4. Structure of the Automotive Industry since the Late 1990s

So far, we analysed how did the CU affected the automotive industry's exports and imports and the response of the industry as revealed in the total factor productivity. In this section, we will take a closer look at how the structure of the automotive industry has evolved since the late 1990s.

In the late 1990s, the automotive industry accounted for 7.7 per cent of manufacturing value added and 5.4 per cent of manufacturing employment (see Table 1). While the industry's value added share increased to 11 and 11.6 per cent respectively in the late 2000s and the early 2010s, its employment share decline to 4.8 per cent. Motor vehicles had the highest share in employment and value added in late 1990s. Motor vehicles' leading position in employment was taken over by automotive parts and components in late 2000s and early 2010s. In value added, however, auto parts and components' share increased to close the gap with the motor vehicles.

While the automotive industry employed about 64 thousand people in 2000, it almost doubled the employment by 2009, followed by another 35 per cent increase by 2013. and there was a 60 per cent increase in the number of production workers in five years (UNIDO).[6] When small and informal firms and suppliers in other sectors are taken into account, the automotive industry is undoubtedly one of the leading sectors (in terms of employment generation and creation of value added) in Turkey.

Table 1: Descriptive Statistics on Automotive Industry in Turkey (1995–2000, 2006-2009, 2010-2013 averages)

	Number of employees (end year)	Employment share (per cent)	Value added share (per cent)	Relative labour productivity	Relative wages
1995-2000					
Motor vehicles	28,060	2.20	4.11	1.86	1.83
Bodies and trailers	2,762	0.28	0.17	0.59	0.81
Parts & components	18,042	1.65	1.30	0.78	1.11
Automotive Industry	*64,313*	*5.42*	*7.69*	*1.42*	*1.59*
2006-2009					
Motor vehicles	40,229	1.55	6.25	3.11	2.39

[6] The Annual Survey of Manufacturing Industries (ASMI) conducted by the TurkStat provides basic data for employment, output and value added at the sectoral level. Unfortunately, the latest year for which the data are available is 2001. For the post-2001 period, the Short Term Statistics (STS) collected quarterly by the TurkStat are used to estimate employment and output growth rates. The STS covers only large establishments producing about 90 per cent of sectoral value added.

Bodies and trailers	10,501	0.40	0.31	0.59	0.68
Parts & components	75,218	2.84	4.38	1.24	1.19
Automotive Industry	*125,948*	*4.79*	*10.97*	*1.77*	*1.46*
2010-2013					
Motor vehicles	43,516	1.31	5.86	3.20	2.42
Bodies and trailers	15,721	0.44	0.46	0.72	0.77
Parts & components	112,358	3.02	5.07	1.20	1.21
Automotive Industry	*171,595*	*4.77*	*11.64*	*1.70*	*1.51*

Source: Calculated from UNIDO, Industrial Statistics Database, 2012 for 1995-200 and TurkStat for 2006-2013.

4.1. Productivity and Wages

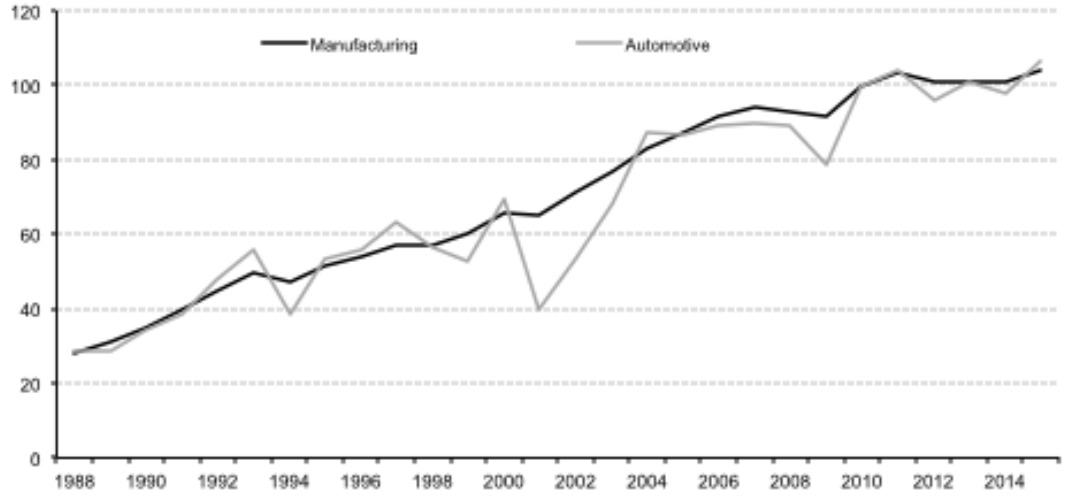
Until 2006, the pattern of productivity growth in automotive industry was very similar to the pattern of output growth. The automotive industry did not increase its labour productivity to a large extent from the early 1990s until the early 2000s, a period dominated by the boom and bust cycles. The negative and detrimental effects of the domestic and external crises on labour productivity in the automotive industry can be seen in 1994, 1999, and 2001 and 2009. Labour productivity recovered rapidly after the 2001 crisis and more than doubled from 2001 to 2006. It fell again during the 2009 recession and recovered quickly in 2010 (Figure 9).

Labour productivity in the automotive industry tracked the average for the manufacturing industry all throughout the period. This could be a result of two phenomena. First, the auto industry accounts for a significant share in the manufacturing industry output. Second, the production processes in the auto industry are classified as requiring medium-level technology. That is why the labour productivity in the industry tracks the manufacturing productivity from below.

To sum up, the automotive industry's productivity growth performance is almost equal to the manufacturing average. However, the *level* of productivity is also important in assessing industrial performance.

The data on labour productivity reveal that there are substantial productivity differentials between motor vehicle manufacturers and other manufacturing industries in the 2000s. While, in late 1990s the motor vehicles industry was 86 per cent more productive than the manufacturing industry average, its productivity lead increased further to reach 220 per cent by early 2010s (Table 1). Auto parts and components manufacturers industry, which used to be less productive (78 per cent of the manufacturing average) in late 1990s, improved its productivity significantly in the 2000s. In late 2000s and early 2010s, labour productivity in the auto parts and components sector was around 20 per cent higher than the labour productivity in the manufacturing as a whole. Despite some improvements, the labour productivity in the automotive bodies and trailers, continued to be below the manufacturing average.

Figure 9: Industrial Labour Productivity Index (1980–2010, 1997=100)



Source: TurkStat.

Being more productive relative to other manufacturing industries, automotive firms can afford to pay higher wages. In the second half of 1990s, wages in the automotive industry was, on average, 59 per cent higher than those in the manufacturing industry.

Motor vehicles industry paid even a higher, 83 per cent, premium to its employees, while bodies and trailers producers paid 19 per cent less than the average manufacturing wage. Over time, the wage premium paid by motor vehicles industry increased to 140 per cent by early 2010s. Even though, the wage premium paid by the parts and components industry also accorded a slight increase to 21 per cent over the average manufacturing wage, the wages in the bodies and trails industry continued to stay below the manufacturing industry average.

Table 2: Relative Productivity and Wages, Selected Countries (1998–2002 and 2005-2008 average values)

	Relative Labour Productivity		Relative Wage Rate		Relative Unit Labour Cost	
	1998 2002	2005 2008	1998 2002	2005 2008	1998 2002	2005 2008
			3410 Motor Vehicles			
Turkey	0.28	0.26	0.24	0.39	0.92	1.49
Hungary	0.33	0.52	0.16	0.35	0.48	0.68
Spain	0.27	0.35	0.50	0.70	1.89	2.01
Brazil	0.24	0.38	0.32	0.36	1.36	0.94
India	0.06	0.14	0.07	0.10	1.23	0.76

Indonesia	0.39	0.67	0.06	0.07	0.28	0.11
Korea, Rep. of	0.64	0.92	0.45	0.92	0.77	1.00
Malaysia	0.22	0.12	0.14	0.12	0.63	1.10
Germany	0.31	0.44	0.87	1.23	2.88	2.83
Italy	0.16	0.30	0.43	0.60	2.96	2.09
Japan	1.24	1.36	1.18	1.06	0.96	0.80
3430 Automotive Parts and Components						
Turkey	0.24	0.22	0.17	0.24	0.73	1.06
Czech Rep.	0.14	0.25	0.12	0.21	0.87	0.86
Hungary	0.15	0.31	0.12	0.27	0.79	0.90
Slovak Rep.	0.06	0.16	0.06	0.19	1.01	1.23
Spain	0.42	0.53	0.49	0.77	1.19	1.46
Brazil	0.24	0.29	0.19	0.23	0.80	0.79
India	0.05	0.07	0.04	0.05	0.76	0.76
Indonesia	0.11	0.15	0.04	0.05	0.41	0.38
Korea, Rep. of	0.45	0.76	0.32	0.57	0.71	0.75
Malaysia	0.15	0.11	0.11	0.12	0.73	1.12
Germany	0.53	0.71	0.85	1.24	1.60	1.74
Italy	0.45	0.55	0.49	0.75	1.10	1.38
Japan	0.84	0.93	0.88	0.86	1.05	0.94

Note: Relative to the corresponding value in the U.S. automotive industry. For the following countries, due to missing data averages are calculated over shorter period: Brazil, 2005-2007; Czech Rep., 1998-1999, 2001-2002; Indonesia, 2006-2008; Japan, 2007-2007; Malaysia, 2000–2002; Turkey, 1998–2001.

Source: Calculated from UNIDO, Industrial Statistics Database, 2007 & 2012.

While the automotive industry in general and motor vehicles industry in particular took a great step forward from the late 1990s to the late 2000s, its relative productivity and wage growth slowed down from the late 2000s to the early 2010s. As we will discuss later, the industry has been facing difficulties in continuing its rapid growth. We think that last year's industry-wide labour disputes could be a reflection of the productivity and wage growth slow down that we have observed through 2010-2013.

A comparative analysis is necessary in order to shed light on the determinants of modes of integration with the global economy. Table 2 presents the data on relative labour productivity, relative wages and unit labour cost in Turkey and a group of developing and industrial countries.

"Labour productivity" is measured as value added per employee (measured at current prices and exchange rate) relative to the level in the US. Relative wages are calculated in the same way. "Unit labour cost" is simply the ratio between wage bill and value added (divided by the US ratio), which shows the wage cost of producing one unit of value added. In order to reduce the effects of annual changes, the average values for the last four years for which the data are available for most of the countries in the sample are calculated. In order to compare the time series behaviour of relative productivity and wages we also present the average values for the 1998-2002 period.

Motor vehicles (ISIC 3410) and automotive parts and components (ISIC 3430) manufacturers in Turkey were comparably less productive in the late 1990s and early 2000s. Their productivity was about 24–28 per cent of the U.S. level. However, European producers were also poorly productive both in motor vehicles and auto parts and components industries. It is striking to see that despite the increased productivity in Turkey from late 1990s to the second half of 2000s, neither motor vehicles nor auto parts and components industries were able to close the gap with the U.S.

Wages on the other hand depicted different story. Wages increased in both sectors, but more in the motor vehicles. Actually, wages increased almost invariably in all countries considered from the late 1990s to mid-2000s. Analysing the relative behaviour of the relative productivity and wages together, we observe that from late 1990s to the second-half of 2000s unit labour costs in the Turkish automotive industry increased by around 50 per cent in both sectors.

The productivity differential between Turkish producers on the one hand, and German and Italian producers on the other hand, was not substantial. Wages in the Turkish automotive industry seem to be higher than those in Hungary, the Slovak Republic, and the Czech Republic, and much lower than those in Italy, Spain, and Germany. As a result, the unit labour cost is lower in Turkey than the one in European countries (with the exception of Hungary in our sample). Turkey has a cost disadvantage against most of less developed and rapidly industrializing countries (India, Indonesia, Korea, and Malaysia). Changes in the direction of foreign trade in motor vehicles provide useful evidence on the mode of integration into the global economy (see Table 3).[7] The direction of foreign trade in the case of automobiles is very interesting. Turkey imports a large part of its automobile components and automobiles (final products) from developed, mainly EU, countries (99 per cent in 1995 and 92 per cent in 2008). A large proportion of Turkey's exports of automobile bodies, parts and components go to developed countries (88 per cent in 1995, and 85 per cent in 2005 and 2008). Moreover, the developed countries have increased their share in Turkey's exports of motor vehicles, from 71 per cent in 1995 to 84 per cent in 2005 and 93 per cent in 2008. In other words, intra-industry trade has become more important between Turkey and the EU in automobiles and automobile components.[8] Turkey both imports and exports these products at an increasing level to/from the EU, i.e. the Turkish automotive industry has fully integrated with the European production chains.

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[7] Kaminski and Ng (2006) define automotive network as a "producer-driven" network.

[8] Since most automotive manufacturers in Turkey are partially or fully owned by multinational companies operating various manufacturing plants in European countries, a large part of intra-industry trade is indeed intra-firm trade. For example, Ford Otomotiv imported 6.8 billion liras worth of motor vehicles and parts and components (40 per cent of sales revenue) from its parent company in 2015 (the Independent Audit Report for Year 2015 submitted to the Istanbul Stock Exchange).

Table 3: Direction of Foreign Trade in Automobiles, 1990 and 2005 (US$ million)

	Imports				Exports			
	Dev'ing	%	Dev'ed	%	Dev'ing	%	Dev'ed	%
1995								
Bodies, parts & comp.	4	1	881	99	43	12	315	88
Motor vehicles	8	1	889	99	128	29	310	71
2000								
Bodies, parts & comp.	41	2	1,709	98	103	15	565	85
Motor vehicles	80	2	4,097	98	143	16	741	84
2008								
Bodies, parts & comp.	453	8	5,521	92	658	15	3,762	85
Motor vehicles	608	6	8,886	94	982	7	13,749	93

Source: UNIDO, Industrial Demand-Supply Balance Database, 2012.
Notes: 1) Dev'ing and Dev'ed denote "developing" and "developed" countries, respectively.
2) ICT components: ISIC 3210; ICT products: ISIC 3000, 3220, and 3230. Automobile components: ISIC 3420 and 3430; Automobiles: ISIC 3410.

Apparently, Turkey has been increasing its automobile exports to the EU thanks to its low unit labour costs relative to European producers, and geographical proximity to main markets (and suppliers) that provides cost and delivery advantages over distant low-cost producers. The average unit price of exported and imported passenger cars could be used as a measure of product "quality." The average (fob) unit price of passenger car exports was about 10–20 per cent lower than the average (cif) unit price of imports in 1999 and 2000. The economic crisis 2001 and the devaluation of the Turkish lira in the same year led to a decline in export prices and an increase in import prices (denominated in U.S. dollars). The average unit price of exports tended to increase gradually, from US$7,600 in 2002 to US$12,800 in 2005, whereas the average unit price of imports remained almost the same (US$13,200 in 2002 and 2005, see State Planning Organization, 2005: 24–27). Thus, the difference between the export and import prices declined to 3–5 per cent. Considering the cost of insurance and freight, one may conclude that there is not substantial quality difference, on average, between imported and exported passenger cars in Turkey.[9]

The improvement in the quality of products necessitates substantial investment in process renewal and new model development. As we have already shown above in Figure 7, the increase in the industry's overall investment and its investments in new model development in 2000s, helped them introduce models that satisfy the demand for higher quality and more diversity.

[9] The average unit price is determined by a large extent the composition of imports/exports. We implicitly assume that there is not much change in the composition of imports/export during the period under investigation.

4.2. Firm-Level Performance

The automotive industry has undergone a process of transformation in the last decade, and the outcome of this process has been observed in recent years. Since official sectoral-level data for recent years are not available, firm-level data could provide additional information about this transformation process.

Before analysing the firm-level performance from publicly available information on balance sheets, it will be helpful to give some information on foreign direct investments in the industry.

In early 1990s, subsidiaries of four multinational corporations (Fiat, Ford, Mercedes Benz, and Renault) were operating in the Turkish automotive industry, with a sizeable market share and more than 20 years of experience.[10] In the mid-1990s, with the increasing prospects of a CU agreement with the EU, Japanese and Korean companies (Honda, Hyundai, and Toyota) started investing in Turkey in joint ventures with Turkish industrialists or, as in the case of Isuzu, expanding existing joint ventures.[11] Perhaps because of the uncertain business environment in Turkey, these companies did not make substantial investments initially and built plants with small production capacities (in the vicinity of 10–20,000 units per year). Once the CU with the EU went into effect in 1996, the domestic market gradually opened up to competition from the EU. Actually, in the first couple of years of the CU, the sector struggled with wild fluctuations in domestic demand as well as competition from imports. The contagion from the Russian crisis of 1998 and the Marmara earthquake of 1999 effectively hit the demand in the auto market.

However, there was a lot at stake. There was already substantial production capacity coupled with a competitive parts and accessories industry. In addition, domestic business establishments with years of experience in the automotive industry and cheap but good-quality labour induced MNCs in the automotive sector to increase their investments in Turkey and built new capacity to produce motor vehicles for the European market. None of the multinational corporations with a sizeable presence decided to close down their plants in Turkey.[12]

The auto parts and components industry also was successful in attracting foreign investors. Most of the world leaders of the sector have joint ventures with Turkish partners. Some of them are big suppliers like Robert Bosch, Valeo, Delphi Packard, and Mannesmann Sachs.

Coming back to the structure of the industry today, the Automotive Manufacturers' Association (OSD) is the main umbrella organization for the automobile producers in Turkey. All major producers are members of the organization. Six passenger car producers have foreign participation, four of which are majority foreign-owned.[13] There are 8 other companies (2 of them foreign

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[10] Obviously there were other producers active in the domestic market. The listed four had the largest market shares in the automotive industry.

[11] Of these four MNCs, Toyota and Honda decided to become the sole owners of their production units (and Hyundai increased its shares to 70 per cent) once they decided to target their production towards the European market rather than the domestic market. This fact can be taken as an example of the difficulty that foreign investors face when entering the domestic market without an insider on board.

[12] Only Opel closed down its small plant near Izmir that was used to undertake the assembly of some of its car models.

[13] Home countries: EU (2), Japan (2), United States (1), and Korea (1).

owned) that produce trucks, pickups, buses, minibuses, and road and farm tractors. Thus, the automotive industry has been dominated by subsidiaries of multinational corporations.

There are a large number of suppliers located mainly in the Marmara region. The Association of Automotive Parts and Components Manufacturers (TAYSAD) has 342 members.[14] Almost a quarter of TAYSAD members have a foreign ownership.

A number of automotive manufacturers are listed on the Istanbul Stock Exchange (see Table 4). The financial statements of these companies are audited by independent auditors and are publicly available. Thus, the financial data on listed companies could be used to shed light on recent changes in these sectors. The majority of the companies, especially the motor vehicles manufacturers, listed in Table 4, increased their employment levels and export rate while lowering dependence on imports for inputs over the last ten years.

The export data at the firm level reveal that automotive manufacturers reacted swiftly to the 2001 crisis and the devaluation of the Turkish lira, and increased export rates substantially in 2001 and 2002 (see Figure 10). The lira appreciated rather rapidly after the crisis until 2006, so much that it was (in real terms) 25 per cent overvalued in 2005 compared to 2000. In spite of the appreciation of the lira, the automotive manufacturers were successful in keeping their export rates at a higher level than the pre-crisis level. Apparently, their export intensity reached and remained at a higher plateau after the crisis. While the average export intensity of the motor vehicle manufacturers moved close to 40 per cent, the average export intensity for the parts and components manufacturers stayed above 40 per cent since 2006 and started to increased increase close to 60 per cent over the last two years.

[14] The member companies of OSD and TAYSAD employed 43,683 and 140,000 people, respectively, in 2014 (see the organizations' Web sites: http://www.osd.org.tr and http://www.taysad.org.tr).

Table 4: Turkish Automotive Industry Producers listed on the Istanbul Stock Exchange

	No of Employees		Export rate (%)		Import rate (%)	
	2005	2015	2005	2015	2005	2015
Motor Vehicles						
Anadolu Isuzu (F)	741	944	15.0	8.0	34.0	45.4
Ford Otosan (F)	7,722	10,745	42.7	64.0	63.0	45.4
Karsan (D)	957	1,748	3.5	27.2	61.8	34.5
Otokar (D)	988	2,105	37.0	29.3	43.0	33.3
Tofaş (F)	4,379	8,018	48.7	57.7	46.1	45.1
Parts & components						
Bosch Fren S. (F)	246	121	81.2	16.4	57.0	36.6
Ditaş Doğan (D)	576	384	41.0	45.8	24.0	19.6
Ege Endüstri (D)	474	567	59.0	83.6	25.0	18.6
F-M İzmit Piston (D)	24	64	22.3	75.7	4.1	25.5
Mutlu Akü (2014, F)	561	807	36.0	31.0	55.0	--
Parsan (D)	565	1182	66.0	71.0	33.0	--

Source: Istanbul Stock Exchange.

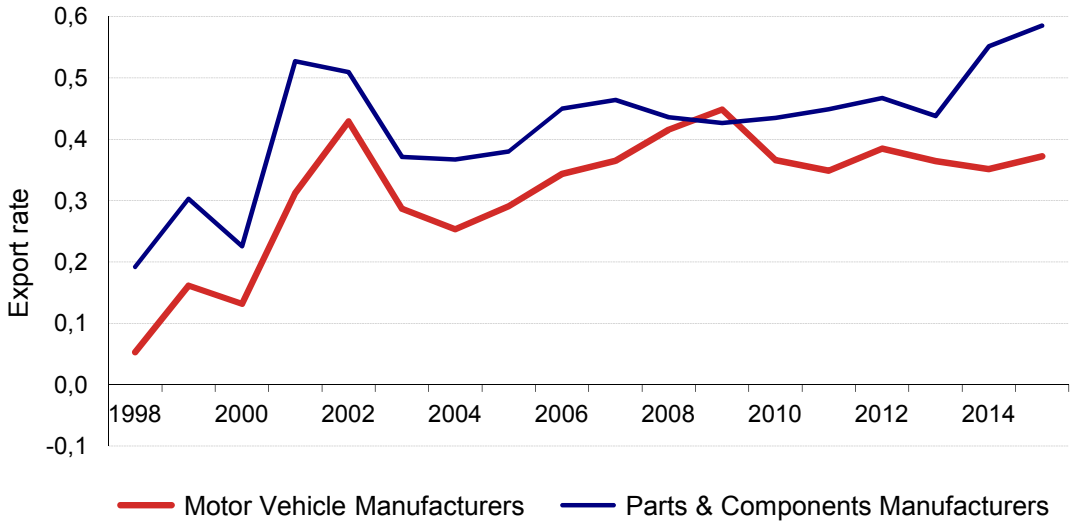
Notes: 2015 data for the number of employees, export rate, and import rate. Export rate is the share of exports in sales revenue. Import rate is the proportion of imported inputs to sales revenue. Foreign/Domestic ownership is indicated by F/D in parenthesis next to the name of the company.

The automotive manufacturers experienced, on average, declining profitability[15] in the second half of 1990s that hit bottom during the 2001 crisis. They gradually recovered after the crisis and the profit margin increased to positive levels in 2002 and 2003. However, the profit margin has remained low (slightly above 5 per cent, weighted average) since the second half of 2000s (see Figure 11). While Karsan and Isuzu's net profit margins fluctuate substantially, that of major car producers Ford and Tofas has been quite steady, moving up to 7-8 per cent. While motor vehicle manufacturers weighted average profit margin has stayed flat for a long time that of the parts and components manufacturers recently increased significantly to surpass the 20 per cent mark.

[15] Profit margin is measured as net profits after taxes/net sales ratio.

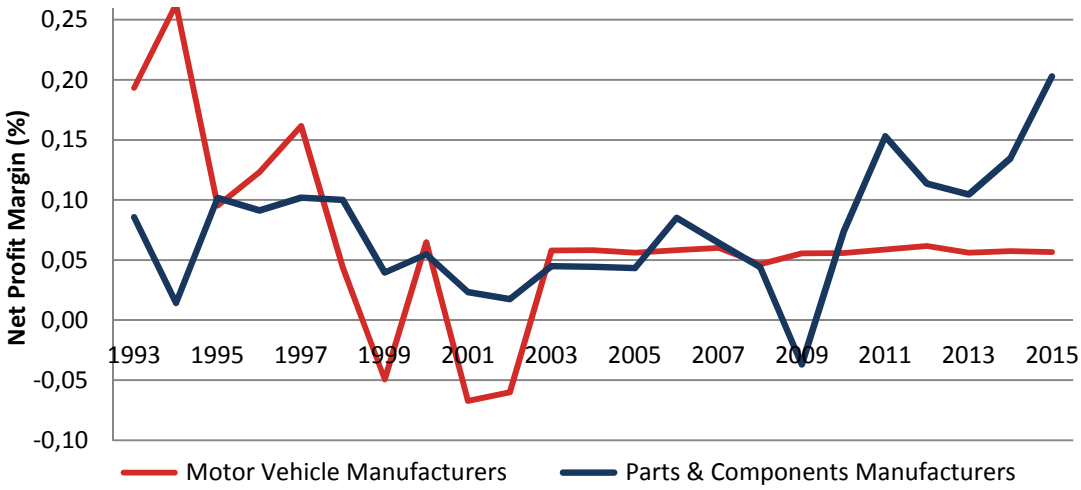
The profitability data show that especially the motor vehicles manufacturers operate on thin margins (an average of slightly above 6 per cent), and their sales revenues are only slightly more than their expenses. In other words, price competition seems to be very important especially for consumer electronics producers.

Figure 10: Export-Output Ratio of Automotive Companies, 1998-2015



Source: Istanbul Stock Exchange.

Figure 11: Net Profit Margin of Automotive Companies, 1993–2015 (net profit after taxes/net sales, weighted average)



Source: Istanbul Stock Exchange.

5. The Integration and Upgrading in the Global Value Chains

Our analysis indicates that the Turkish automotive industry has integrated with the global, especially the European, value chains since the mid 1990s as a result of the CU with the EU. In order to understand the process of integration with the global value chains (GVCs), and gradual upgrading achieved within these system, we need a detailed product-level analysis of the structure of Turkey's international trade.

The concept of GVC encompasses all activities that are required to bring a product from conception through the different stages of production. GVCs arise as a result of slicing up the production chain, and relocating activities across countries, and "value" will be accumulated through consecutive stages of production. In the context of the automotive industry, different stages of production can be defined as the production of the final product (motor vehicles), main component (engine) and standard part and components.

By using the UN's Classification by Broad Economic Categories (BEC) and the Harmonized Commodity Description and Coding Systems (HS, Version 1996), we classified the automotive products into 5 categories and products defined at the HS 6-digit level were associated with these categories. The product categories are as follows:

- Automobiles (spark ignition and diesel engines)
- Trucks, tractors and buses (TTB)
- Engines (spark-ignition and diesel)
- Mechanical components
- Electrical components

Automobiles and trucks, tractors, and buses (TTB) represents the final product, engines the main component, and mechanical and electrical components are standard parts and components. Electrical components (Ecomp) include the part and components such as ignition magnetos, magneto-generators and flywheels, distributors and ignition coils, starter motors and generators and alternators, whereas mechanical components (Mcomp) are a diverse set of products including, for example, pneumatic tires, bumpers, safety seat belts, brake system parts, transmissions, drive axles, radiators, seats, etc.

Figure 12: World Exports of Automotive Industry Broad Product Categories, 1994–2015

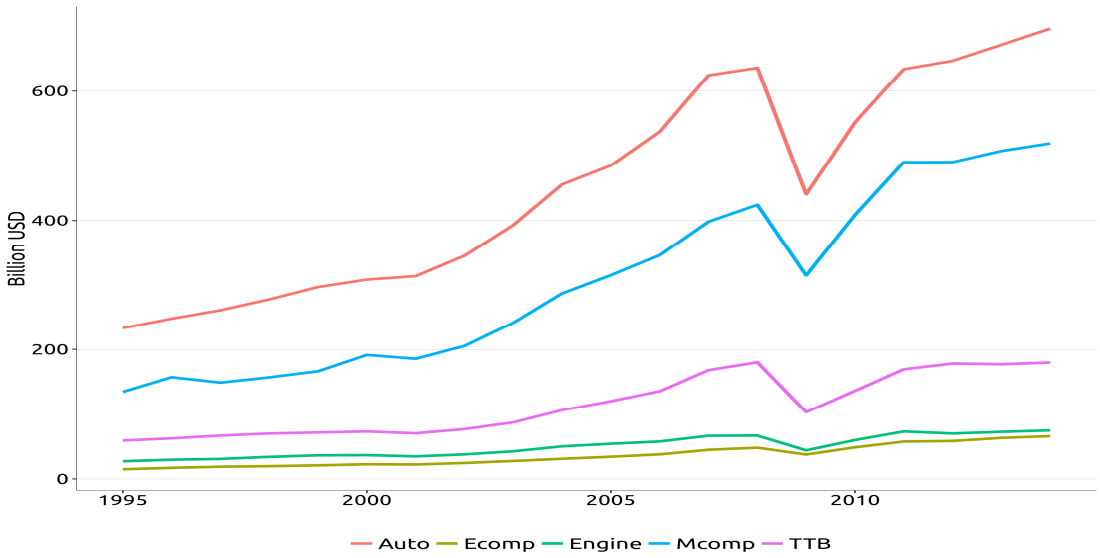
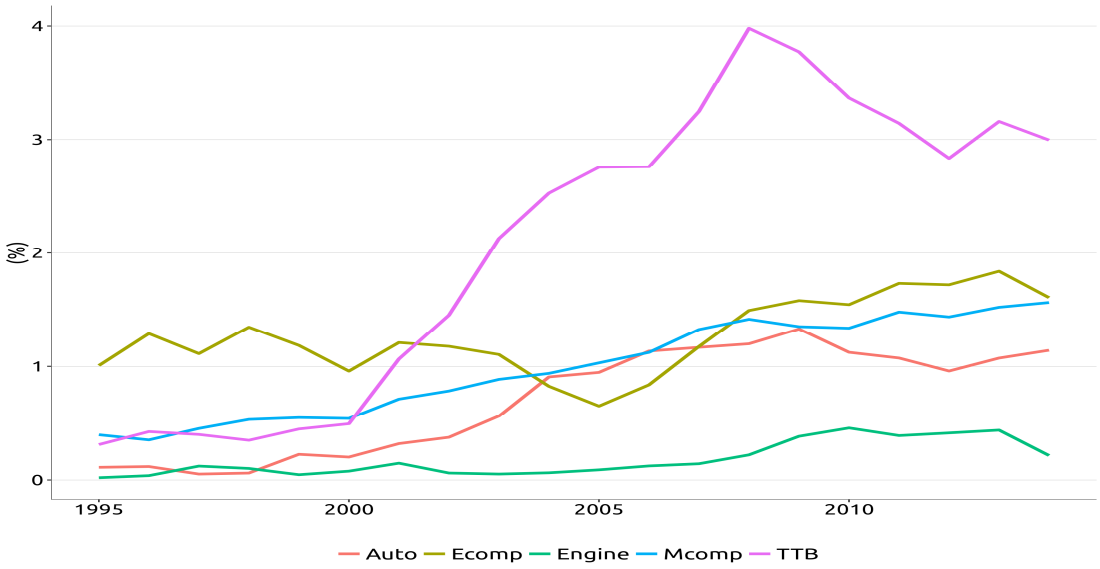


Figure 12 presents the data on the value of international trade for these five categories of products.[16] There is a rapid increase in the export value of automotive products in the first half of 2000s, which was hit by the 2008-2009 crisis. World trade in automotive products had increased 12 times from 1998 to 2007 (the compounded annual growth rate was about 32 per cent in that period).[17] Export value declined sharply (by 32 per cent) in 2009, and did not bounce back after the crisis: when deflated by the world GDP deflator, the real value of international trade in 2014 was almost equal to its level in 2007.

Figure 13: Turkey's Share in World Export (Broad Product Categories)

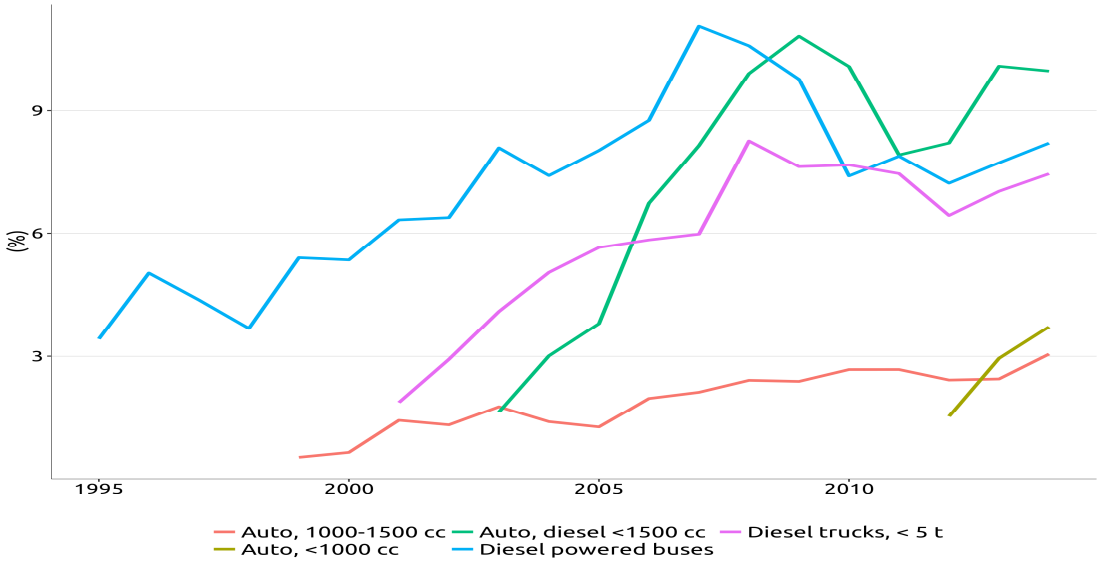


The Turkish automotive industry achieved even a faster increase in exports in the same period in all product categories so that Turkey's share in world trade improved considerably (see Figure 13). The most remarkable increase is observed in the case of TTB: Turkey's share in world truck, tractor and bus exports was only 0.5 per cent in 2000 but it jumped to almost 4 per cent in 2008, and declined to 3 per cent after the world economic crisis.

16 The CEPII's harmonized international trade data was used in this section (http://cepii.fr).

17 The rate of inflation for the world was about 3 per cent per year, i.e., the annual real rate of growth was 29 per cent.

Figure 14: Turkey's Share in World Export
(by HS 6-digit Final Product Categories)



At the detailed product level (HS 6-digit level), there are three products that account for the export boom: diesel powered buses, light diesel trucks (diesel powered trucks weighing < 5 tonnes), and light diesel automobiles (automobiles with a diesel engine of <1500 cc) (see Figure 14)[18].

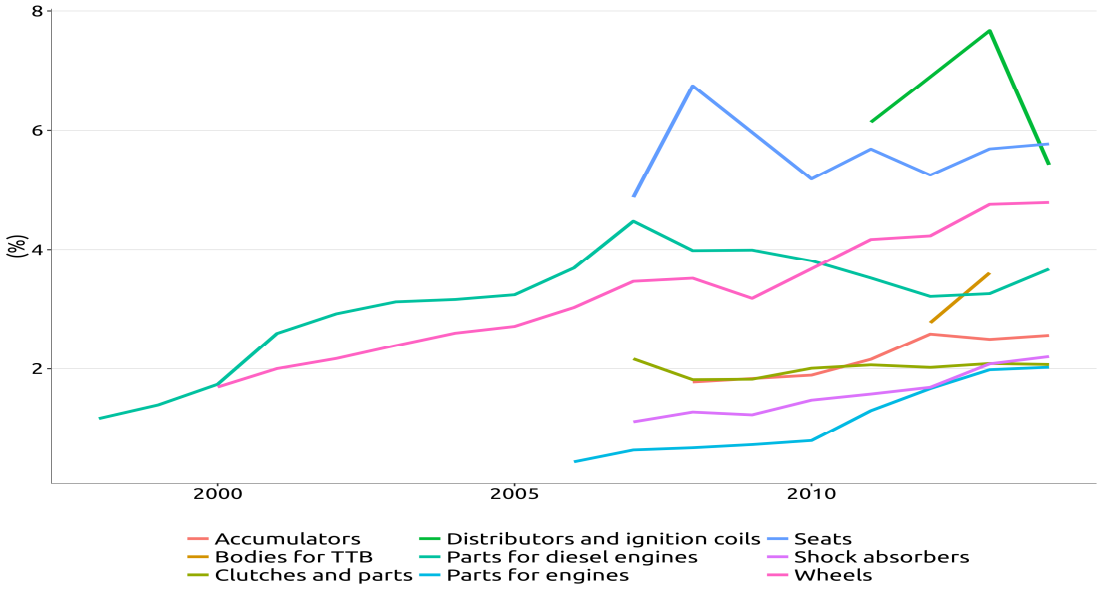
Turkey's market share in automobiles and mechanical components also achieved a continuous increase from the mid-1990s until the crisis in 2009: automobiles share reached 1.3 per cent in 2009 from 0.1 per cent in the mid-1990s, whereas the share in mechanical components gradually increased from 0.4 per cent in the mid 1990s to 1.6 per cent in 2014. In contrast to other categories, Turkey's exports of mechanical components preserved its positive trend even after the crisis. In the case of electrical components, Turkey's exports started to increase in the second half of 2000s, and, as in the case of mechanical components, it continued to increase in the early 2010s.

Turkey's share in world trade of engines was very low in the 1990s and early 2000s. It improved considerably after 2005, and reached almost 0.5 per cent in 2010, and remained at that level.

At the product level, distributors and ignition coils, seats, wheels, parts for diesel engines, and bodies for tractors, buses, trucks are the products in which Turkey has actively participated in the GVCs in recent years (see Figure 15).

18 Figures 14 and 15 present the data for HS 6-digit level products in which Turkey's share in world exports is higher than 2 per cent, and the value of Turkey's exports is higher than $100 million.

Figure 15: Turkey's Share in World Automotive Exports (by HS 6-digit Parts and Components Categories)



The data on Turkey's export share reveal that Turkey's integration with the automotive GVCs has been intensified in all product categories. Upgrading within GVCs is an important issue that attracts the attention of policy makers, because integration without upgrading may not be beneficial for the industry and the country.

There are four types of upgrading identified in the literature (Gereffi et al. 2001; Gereffi 2014):

- *Process upgrading:* Firms can increase their productivity by using their resources more efficiently and effectively. For example, process upgrading may involve replacement of craft production by mass production, and then mass production by lean (or just-in-time) production.
- *Product upgrading:* Firms can increase their productivity by moving into more sophisticated product lines. The "sophistication level" of a product can be measured by unit value, labour productivity or task content.
- *Functional upgrading:* Functional upgrading implies opportunities within the existing value chain (for this reason, it is also called "intra-chain upgrading"). For example, firms can increase their productivity by acquiring new functions (or abandoning existing functions) to move towards skilled labour-intensive activities.
- *Chain upgrading:* In this case, the firm moves into new (and related) value chains that are more productive (this is also called "inter-chain upgrading"). In this type of upgrading, the firm applies the competence acquired in a particular function of a chain to a new sector.

The outcome of process and product upgrading is the increase in the sector's competitiveness, and the value added content of its products. Functional upgrading will manifest itself in the changing composition of exported products and countries.

The data presented above reveal that Turkey's share in all categories of automotive products has increased since the mid-1990s. The increase in the world export share supports the hypothesis that

the Turkish automotive industry achieved process and/or product upgrading so that it has become more competitive in those products.

In order to understand the extent of process and product upgrading we use the data on (relative) unit values as a measure of product quality. Relative unit value is defined as

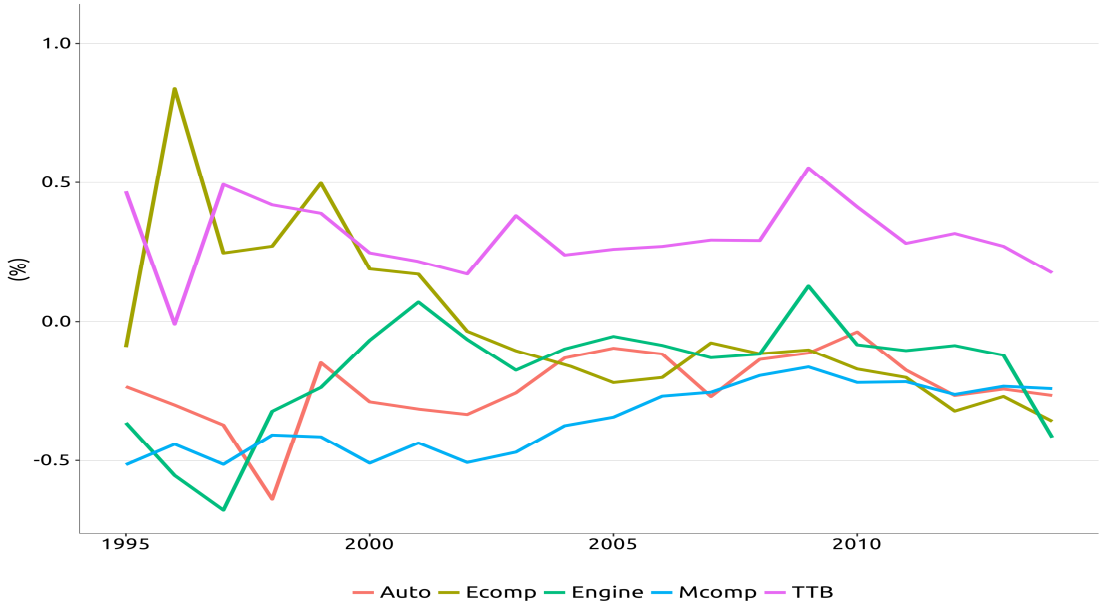
$$\text{ruv} = log((x_T/q_T)/(x_W/q_W)),$$

where x refers to the value of export, and q the quantity of exports. Subscripts T and W denote Turkey and the world, respectively. Since the relative unit value measure is defined in the log form, a positive number means the unit value of Turkey's exports is higher than that of the world (Turkey produces higher quality/high value added products for that segment), whereas a negative value implies the opposite.

As shown in Figure 16, Turkey's relative unit value is higher only in the case of trucks, tractors and buses, mainly thanks to the exports of diesel-powered buses, and light diesel trucks. In all other product categories, relative unit values are negative.

There is only one product category in which Turkey seems to achieve product upgrading: mechanical components. The relative unit value of mechanical components produced in Turkey increased almost continuously for almost a decade in the 2000s. However, that trend seems to halt in the early 2010s.

Figure 16: Relative Unit Values of Turkish Automotive Exports (by Broad Product Categories)



The case of electrical components is worrisome. The relative unit value was positive in the late-1990s, but one should be careful in interpreting the unit value data for electrical components for the 1990s because of the very low value and incidence of exports. The relative unit value of exports has declined almost continuously since the early 2000s. This may indicate that Turkish producers have been specialized in low value added electrical components without any significant product upgrading.

A network analysis could provide additional information on the integration and upgrading in the GVC. The network charts for five product categories for three time periods (1995-1997, 2004-2006, and 2012-2014) are summarized in Figures A1-A5. To eliminate the effects of annual fluctuations, the average values for 3-year periods are used.[19] To simplify the network charts, the trade flows less than $150 million for autos and mechanical components, and $50 million for TTB, engines and electrical components are deleted.

The charts for the automobile trade show that Turkey was not a significant player in the international market in the mid 1990s (see Figures A1.a, A1.b and A1.c). Turkey imported automobiles from Germany, and its export value to any partner did not exceed $150 million. However, within a decade, its participation in the GVC intensified rapidly. Turkey has become a major importer of automobiles from established European producers (Germany, France, the UK, Belgium, Spain), Poland, and Korea, and exported to established European markets (Germany, France, the UK, Belgium, Spain), Italy and Russia. As a result of its deeper integration, Czech Republic and Romania were added into the list of major auto suppliers, whereas Turkey diversified its exports to Israel. The evolution of Turkey's major export markets and import sources has followed closely the origin of multinational firms invested in the Turkish automotive industry. The network for trucks, tractors and buses is sparse compared to the automobile network (see Figures A2.a, A2.b and A2.c). There are fewer countries and links forming the TTB network, even though we use a lower export threshold for this category. Turkey used to import from Germany and export (temporarily) to Russia in the mid-1990s. In the mid 2000s, the Netherlands became a major supplier whereas France has become the largest export market for Turkish producers. That pattern did not change in the mid-2010s.

The network for mechanical components complements the story about the evolution of the auto network (see Figures A3.a, A3.b and A3.c). Turkey used to import mechanical components from Germany, the UK and Italy in the mid-1990s, and did not export these products in large volumes to any country. However, in the mid 2000s, its imports of mechanical components followed a pattern similar to that of automobile imports: Germany, the UK, Italy, France, Spain, Japan and Korea were the largest suppliers of mechanical components in the mid 2000, whereas Turkey started to export these products to Germany, the UK, Italy and France, partly as a result of process and product upgrading in the automobile GVC. In the mid 2010s, China has become another supplier of mechanical components for Turkey, whereas Turkey continued to expand its markets, including Belgium, Spain and Russia.

Turkey was not involved heavily in the electrical components network until the early 2000s (see Figures A4.a, A4.b and A4.c). As mentioned above, Turkey's share in the global market for electrical components increased only after 2005. The main supplier of electrical components for Turkey is Bulgaria whereas Turkey exports these products mostly to the UK, France, Belgium and Sweden.

In spite of positive developments in recent years, engine production and trade is the weakest link in Turkey's integration with the GVCs (see Figures A5.a, A5.b and A5.c). Turkey imported engines from Germany and the UK in the mid 1990s. Its suppliers have diversified in the mid 2000s as a result of investment by multinational companies in the Turkish automobile industry, and Turkey

19 In order to eliminate the effects of price increases, nominal values are deflated by the world GDP deflator, which is obtained from the World Bank's *World Development Indicators*. 1994 is the base year. Since the data starts from 1995, 1995-1997 is the initial period.

imported engines from Italy, Spain, Poland, Hungary, Japan as well as former suppliers, Germany and the UK. In the mid-2010s, Japan and Hungary ceased to be large suppliers of engines, and France, Romania and India started to export engines to Turkey in large volumes. In this period, Turkey export engines to multinational companies' plants in Romania.

The analysis of the network of international trade provides complementary information about the transformation of the Turkish automotive industry. It shows that Turkey's position in the international division of labour has been largely shaped by investments of multinational firms in Turkish auto industry. The pattern of exports and imports (in terms or destination/source countries, and the type of products trade) is determined by multinational companies' global production decisions. During this process, the Turkish automotive industry has been successful in upgrading its position within the GVC, especially in the categories of light diesel trucks, and buses, and mechanical components.

The network charts visualize the fact that the European countries are strongly integrated with each other in all segments of the industry, and Turkey is being integrated with the sub-network. Turkey's links with the European countries have increased and intensified in the last couple of decades. Apart from the European countries, Turkey has strong links with only Korea, and China is likely to become more important in the future.

The evolution of GVCs also reveals the missing opportunities for Turkey. As being strongly integrated with and oriented towards the European markets, Turkey appears to be not benefiting from its geographical advantages. For example, as shown in Figures A1a-A1c, the Korean automotive industry was able to significantly increase its exports to a number of countries around Turkey, such as Iraq, Syria, Jordan, Egypt and Libya in the early 2010s. Apparently, those Korean firms that operate in Turkey were not exporting to Turkey's neighbours, perhaps because multinational automotive firms make their production and export decisions on a global scale.

6. Recent Government Policies and Automotive Industry Performance

The automotive industry in Turkey has proved to be a vibrant and growing sector, and achieved an outstanding export performance in the last decade in spite of the macroeconomic problems that plagued the country. What are the main factors behind its performance?

The automotive industry is well integrated within international production chains. From its inception in the 1960s and 1970s until the late 1990s, foreign firms, either through joint ventures with major domestic business groups or through wholly owned subsidiaries, have been dominant in the industry. Although these companies were oriented toward the domestic market until the early 1990s, they were able to seize new market opportunities opened by the CU with the EU in 1996. New foreign companies entering the Turkish market in the second half of 1990s have targeted the EU market as well. These companies have strong links with their subsidiaries in the EU, and intra-firm trade has apparently played an important role in producing automobiles in Turkey and marketing them in the EU countries.

Although the automotive industry is well integrated within international, or, more specifically, European production chains, it has also benefited to a large extent from the existence of a strong domestic industrial and supplier base. The automobile parts and components sector developed to some extent in the 1970s and 1980s, and attracted foreign investment in the 1990s. Strong and responsive supplier-producer links have enabled automobile producers to expand their capacity and output rapidly after the 2001 crisis (for a comprehensive analysis of supplier-buyer links, see Wasti, Kozan, and Kuman, 2006).

The automotive industry in Turkey would not be successful had it failed to adapt itself quickly to new conditions imposed by the CU. The OSD played an instrumental role in anticipating new challenges and orchestrating a common course of action to face these challenges. The OSD regarded the CU as an inescapable fact, and considered it as an opportunity in the early 1990s.[20] The first challenge was to adopt massive EU rules and regulations affecting the industry. The process of discovering, understanding, and transposing EU rules and regulations proved to be useful in enhancing the competence of technical personnel employed by automobile producers (and government officials). After achieving a certain level of technological sophistication necessary to satisfy the EU rules, the technical personnel pushed forward to improve quality and to introduce new designs (especially in the commercial vehicles segment) to be more competitive in the EU market. "Research and development" became a catchword in the late 1990s.

Automotive industry's two major manufacturers associations (OSD and TAYSAD) have proven to be important catalysts in the industry's successful response to the challenges it faced over the last two decades. Both associations have been working closely with their members, the government, the universities and the public at large to enhance the sector's long-term viability in the face of increased global competition and increase the contribution of the industry to the Turkish economy.

As it has a little more than a dozen members it was easier for the motor vehicle manufacturers under the umbrella of OSD to act together in matters that concern the viability of the whole sector. OSD represented the industry's viewpoint very effectively in very different meetings. OSD representatives were in general active participants of meetings and workshops whether the meetings were directly related to the industrial or R&D policymaking or not. When the latest industrial and regional investment subsidies were announced in 2012, the government designed policy so that automotive industry's research and development efforts would not receive the same support as the other industries. OSD objected to this viewpoint and argued that through the subsidized R&D efforts they were attracting millions of dollars worth of R&D projects to Turkey. In the end, the government agreed with OSD's viewpoint.

According to plans drawn by industry representatives, the industry targeted to make Turkey the third-largest producer in Europe by 2013 as well as making it a centre for design and research and development.[21] Unfortunately, these plans did not work out.

6.1. R&D policies and the Automotive Industry

Manufacturing firms have established R&D centres in big numbers in recent years because the government has made some changes in its R&D incentives framework that would lower the initial cost of establishing R&D centres. For example, in order for firms to be eligible to receive subsidies for their R&D expenditures, they had to employ a minimum of 50 engineers in their R&D centres. With the recent change the minimum number of engineers employed in these centres was lowered to 30. This change, along with others, helped increase the number of firms establishing R&D centres very quickly.

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[20] During the negotiation stage of the CU agreement, the automotive industry was expected to be one of the industries that would face the toughest competition from the EU-origin imports. Thanks to forceful lobbying by the industry, full liberalization of the automotive imports was phased in over a period of five years.

[21] Interview with Ercan Tezer, the Secretary General of the Automotive Manufacturers' Association, April 4, 2007.

Automotive industry was one of the leading industries in responding to these incentives. Majority of automotive producers established research and development units close to their production plants. While initially their R&D efforts mostly focused on simple development activities over time as their engineers gained more experience many automotive firms moved part of their international design activities to Turkey. Finally, these efforts culminated in the development of technology management capability of the Turkish automotive sector. However, the industry still has a lot of room to acquire full capability of technology management.

As of January 2016, there were 232 R&D centres established by private sector companies. With 52 R&D centres, the automotive parts and components manufacturing is the leading sector with R&D centres. Even though all automotive manufacturers have established R&D centres, as there are only 13 of them, the automotive manufacturing sector came fourth in the list. Turkish automotive industry also takes the lead in terms of total R&D expenditures. As of the end of 2014, the Turkish automotive industry accounted for 18.9 per cent of total R&D expenditures undertaken by the Turkish private sector. With this share Turkey ranks third after Germany and Japan, where automotive industry shares in private R&D expenditures were 31.7 per cent and 19.8 per cent.

The automotive industry started investing in R&D activities as early as the second half of 2000s, much earlier than other sectors. Yet, they only recently started undertaking more value added development and design activities in Turkey. In 2015, R&D spending of two leading automotive manufacturing companies, Ford Otomotiv and Tofas, reached to 1.6 per cent and 2.5 per cent of revenues, respectively. The two companies reported that in the same year they employed 1512 and 700 employees, respectively, in their R&D centres.

6.2. Current Tax Policy is the Most Critical Obstacle for the Industry's Next Round of Structural Transformation

While government's R&D policy supports the automotive industry aspirations to become one of the major research and development centres in the European automotive industry where new models and engines are developed for every segment of the industry, its tax policies are currently creating the most formidable obstacle to the industry's next round of structural transformation.

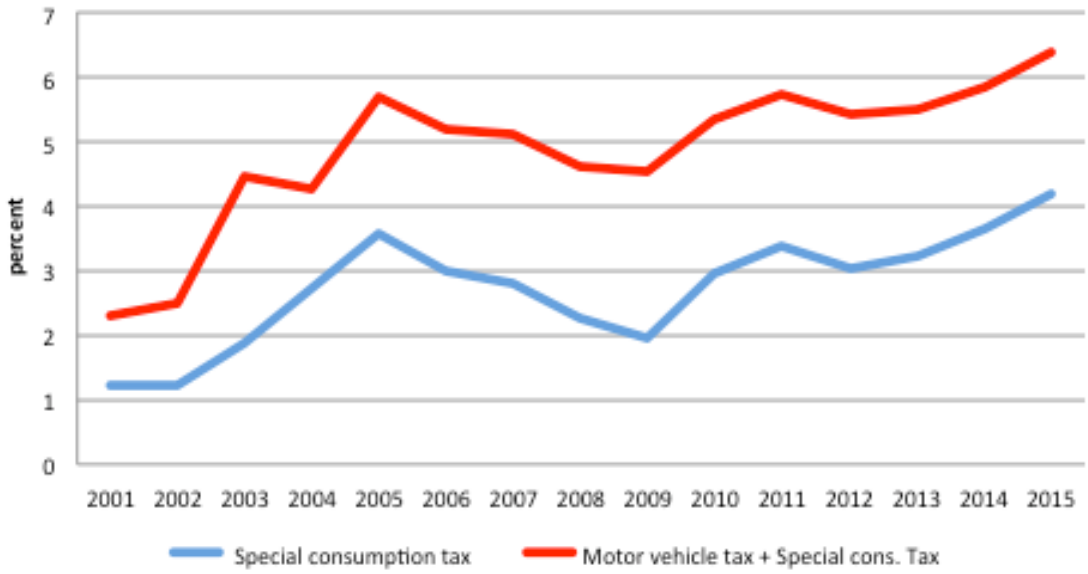
Turkish tax policy is awkwardly shaped by the macroeconomic stabilization attempts immediately after the 2001 crisis. At the time, it was imperative to increase tax revenues in a short period of time. As a result, the most effective and politically feasible way of collecting taxes is to introduce indirect taxes. Turkey increased the VAT rate, as well increasing special consumption tax on some goods and introducing the special consumption tax on many other goods.

The special consumption tax on motor vehicles was introduced in August 2002. The tax targeted mostly automobiles. The tax rate was 27 per cent on cars with engines less than or equal to 1600 cc power, 46 per cent for cars with 1601-2000 cc engines and 50 per cent for cars with engines bigger than 2000 cc engines. Until recently the tax rate on light commercial vehicles kept at a minimum of 10 per cent. SCT tax rates for automobiles however have been increased four times. Now the rates stood at 45, 90 and 145 per cent, respectively.

On top of the already high special consumption tax the government also gets the value added tax. As a result, total indirect tax rate on the car increases significantly. If someone wants to buy a car with a 1600cc or lower power engine, and the car's value is 1 TL, then the person ends up paying 1.71 TLs for the car. If the car has an engine power between 1601cc-2000cc the person will pay 2.3 TL. If the car has a 2001cc or higher power engine, then the car's price will be 2.89 TL.

The special consumption tax and the motor vehicle tax that is paid annually are very important sources of revenue for the government. In 2015, approximately 6.5 per cent of all tax revenues were obtained through the special consumption tax on motor vehicles and the annual motor vehicle tax (see Figure 17). We do not have the information on VAT collections obtained from car sales, but because it is imposed on the already taxes car value, it is likely to be closer to the total value of SCT tax. When we assume that, we come up with a figure of more than 10 per cent of all tax revenues obtained from car ownership. This does not include the SCT on oils and lubricants, which account for close to 12.5 per cent of all tax revenues in 2015.

Figure 17: Tax Revenues from Special Consumption Tax on Motor Vehicles and Annual Motor Vehicle Tax (per cent)



Source: Ministry of Finance

High sales/consumption taxes on cars, not only lower the demand for cars, but also lead to a lower scale of production for the industry. In the long run, this will prove a major obstacle for the growth of the sector. Actually, when we look at the production numbers closely, following the rapid growth performances in the mid-2000s, the industry has not been able to keep the pace of its growth in the 2010s even though real interest rates have fallen significantly since the global financial crisis.

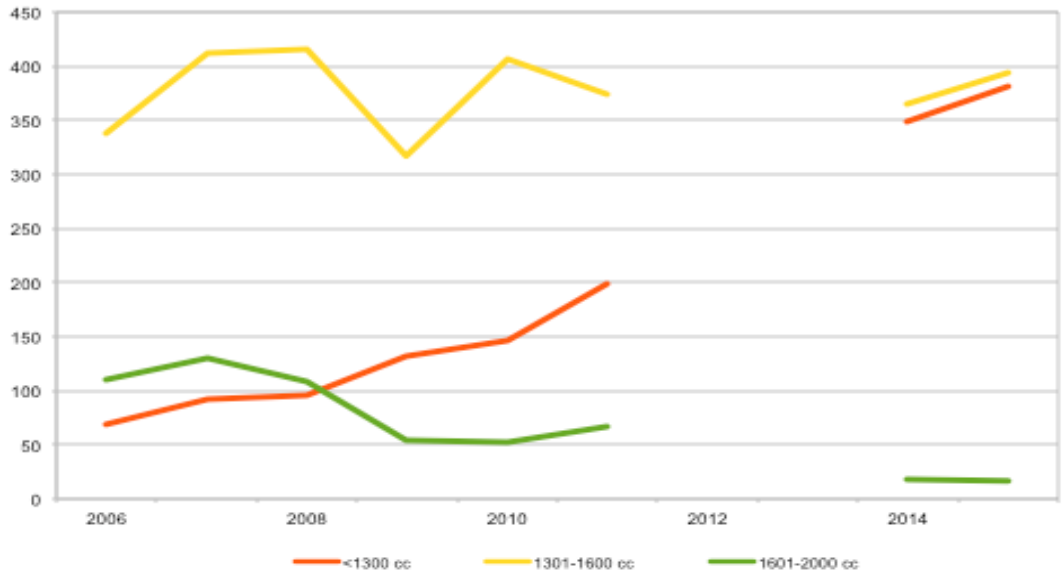
High SCTs on automobiles along with low SCTs on commercial vehicles has so far led the industry to devote a larger fraction of its capacity to LCVs compared to other countries. In 2015, 35 per cent of the motor vehicles produced were LCVs. This focus of the industry on the lower end of the market may prove to be a major threat for the future of the industry.

The best way to prove this hypothesis is to look at the distribution of production in Turkey. The bulk of production takes place in LCVs and small cars, both of which are subject to low consumption tax. On the other hand, less than 20,000 automobiles with engine capacity above 1600cc are produced in Turkey (Figure 18).

As the presence of high consumption taxes on automobiles prevents mass scale production of more sophisticated and higher value added automobiles with engines above 1600cc, it also prevents the multinational firms from bringing higher value added R&D functions to Turkey. After all, firms

introduce their new products mostly in the higher end of the market, because that is where the customers are willing to pay a higher price for a completely new design and/or improvement in the efficiency, etc. After they make use of their best R&D outcomes in the higher end of the market, the companies gradually shift these new products, designs etc. in their mid-market and lower-end products.

Figure 18. Automobile Production by Engine Size ('000s)



Source: OSD

Despite the generous government subsidies, no company would be willing to shift its most critical research and development activities to a country where there is a little expertise in producing higher quality and higher value added cars. Furthermore, no company will start producing a car model in a country where the tax rates on the model can be as high as 200 per cent combined. When the company produces a new model, it should be able to sell a sizeable share of the model in the domestic market. That is, however, impossible in a country where the tax burden on the higher end of the market is very high.

Therefore, with the existing tax system, it would be a serious challenge to move the Turkish automotive industry from the current production level of 1.4 million units to the projected 2 million units.

Finally, in this section we would like to discuss another critical problem with the current consumption tax system, where SCT rates are based on vehicle engine power. Many European and other industrial countries design their vehicle tax systems so that they can minimize the environmental impact of vehicle ownership. For that reason, in their systems tax rates tend to increase with the CO2 emissions. In the current Turkish SCT system, however, companies find ways to avoid taxes. Instead of following the practice in other countries, and mount 1800cc or 2000c engines, the companies prefer to mount 1600c engines in their luxury and/or SUV vehicles. While the avoidance of taxes in this fashion lowers the government tax revenues, the existing tax system does not lead to lower CO2 emissions.

As indicated by Mock (2016), revising the existing vehicle taxation system to be based on the CO2 emission level of a vehicle could complement and hence increase the effects of CO2 vehicle

standards. Once tax system becomes geared towards the control of CO2 emissions, then the very low tax rates on LCVs will have to be increased along with the engine power. Finally, the revision of the current tax system should also include the revision of mandates and incentives for alternative fuels and electrified vehicles. Such a comprehensive revision of the vehicle tax system in return will further enhance technological innovation in the automotive industry.

One may suggest that the special consumption tax is a kind of progressive tax because the tax rate is higher for large-engine cars that are likely to be bought by wealthier people. Moreover, large-engine cars pollute environment more, and higher tax means a tax for negative environmental externality. However, the main motive seems to be tax collection, because the tax rates are directly related to neither the individual's income level nor the car's level of pollution. Moreover, the motor vehicle tax (annual tax paid for each vehicle) reinforces the market distorting effects of the special consumption tax. Similar in spirit to the special consumption tax, the motor vehicle tax depends on the engine size (in the case of new cars, the motor vehicle tax is about 210 dollars for cars with engines smaller than 1300 cc, and as high as around 7570 dollars for cars with engines larger than 4000 cc). However, the motor vehicle tax declines very quickly by age (more than 50 per cent after age 7). Therefore, the motor vehicle tax system reduces the demand for new cars by lowering tax rates for used cars.

7. Conclusions: Lessons to Learn

The development of the Turkish economy since the early 1990s shows that despite the macroeconomic policies and conditions inhibiting investment and growth, certain industries have performed very well and played an important role in generating employment and fostering growth. The automotive industry is certainly among the most successful industries in Turkey in the last two decades. It has achieved remarkable output and productivity growth rates, and has been very competitive in international markets.

The country has had a long experience of production in the automotive industry. Domestic industrialists have had significant experience in the automotive industry either by themselves or in joint ventures with multinational corporations. The automotive industry has a strong domestic supplier base, established during the import substituting industrialization era of the 1960s and 1970s, and has seized the opportunities opened up by the CU by investing in new product and process technology and learning. Both the final product and supplier segments of the industry are well organized, and have established a shared vision of the future through organized dialogue within the industry and with the public sector as well. Industrial leadership, coordination, and cooperation have been vitally important for the success of the automotive industry.

The automotive industry has strong backward linkages to low, medium and high tech sectors. These linkages have so far enabled Turkey to become one of the mid-size players in the global automotive market. However, its ability to survive and thrive in the future will depend on its ability to attract international electronics part suppliers to invest in Turkey. This however will require a structural change in the industry towards higher value added products. According to the end of 2015 market report by the Automotive Distributors' Association, 82.9 per cent of automobile sales in 2015 was accounted by lower segments of the market, namely A, B and C segments.

The success of the automotive industry has much to do with its deep roots in the industrial heartland of the country as well as the increased competition it had to face after the CU rather than macroeconomic policies. Had Turkey adopted the correct mix of macroeconomic and sectoral policies in the 1990s, the majority of the other manufacturing sectors would have realized structural transformations similar to that of the automotive industry.

As a result, Turkey could have undertaken the transformation from a lower middle–income economy with competitive advantage in labour-intensive sectors, into a higher middle–income country with increased focus on technology-intensive sectors.

In the early 1990s, there was no reason for the automotive industry to change the way it ran the business. However, in the 10 years following the formation of the CU, the Turkish auto industry went through a serious transformation period. The seeds of change came about in the early 1990s. The trade liberalization throughout the late 1980s and early 1990s reduced the protection against the motor vehicle imports. However, as the domestic demand was booming, the industry was performing quite well in terms of profits. Import penetration was rather small thanks to the still-high protection rates.

During the negotiation stage of the CU agreement, the Turkish auto industry was expected to face tough competition from EU-origin imports. The industry did not hide this fact and forcefully lobbied the government to gain as much time as possible in order to postpone the full impact of the CU. As a result, the auto industry was one of the sensitive sectors that Turkish side wanted to include in the agreement. Full liberalization of auto imports was phased in over a period of five years. Imports of used cars are still prohibited and likely to continue that way in the near future.

A natural implication of Turkey's large domestic market would be the attraction of FDI to benefit largely from it. However, the automotive sector is a good example of how an initially protected home market can be transformed into a competitive and increasingly export-oriented industry through FDI inflows coupled with the availability of low-cost, qualified labour. During the debate on the CU, the automotive sector was expected to be the worst affected from lowering protection on EU imports. However, that prediction was proven wrong: In the mid-2000s, the automotive sector has become the second-largest export sector.

One of the important conclusions of our study is about the effectiveness of industrial policy in the Turkish framework. We emphasize the lack of a well-designed long-term industrial development perspective in place that led to the current state of the Turkish automotive industry, in particular, and the manufacturing industry, in general. It was not the presence of well-developed and implemented industrial policies that were responsible for the successful development of several sectors in recent decades. Rather, the manufacturing subsectors that performed well in recent decades did so thanks to their organization and their knowledge and experience in international competition. These sectors developed haphazardly despite the fact that there was no government policy framework in place guiding them in their long-run investment decisions.

It is interesting to observe that the policy makers themselves also complain about the lack of a consistent government policy towards the automotive industry. The Ad hoc Expert Committee report on automotive manufacturing, written five years after the Customs Unions, emphasizes the importance of a "Master Plan" for the development of the automotive industry in Turkey. The report explains that the policy towards the automotive industry is related to the industrial and technology policies (taxes, state subsidies, foreign trade, tariffs, etc.) so that it is necessary to design all those policies coherently within the context of a Master Plan (SPO, 2001: 7). A report prepared by the private sector a year later echoes the same concern, and considers the lack of a "National Master Plan" among the weaknesses of the automotive industry (ICI, 2002: 44).

The analysis on the export patterns and GVCs shows that Turkey's position in the international division of labour has been largely determined by the multinational firms whose subsidiaries are important players in the Turkish automotive industry. The pattern of exports and imports (in terms of destination/source countries, and the type of products traded) is determined by multinational companies' global production decisions.

Automobile producers in Turkey, as a group, were able to relocate their position vis-à-vis the European value chains by skillfully managing the benefits of geography (proximity to the European markets) and its metalworking capability. However, existing tax policies (especially the special consumption tax scheme) have created significant obstacles for firms, which in principle can move their production and R&D activities towards high quality/high value added segments of the industry.

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Appendix -- Network Graphs

Figure A1.a: Network for Automobiles (1995-1997)

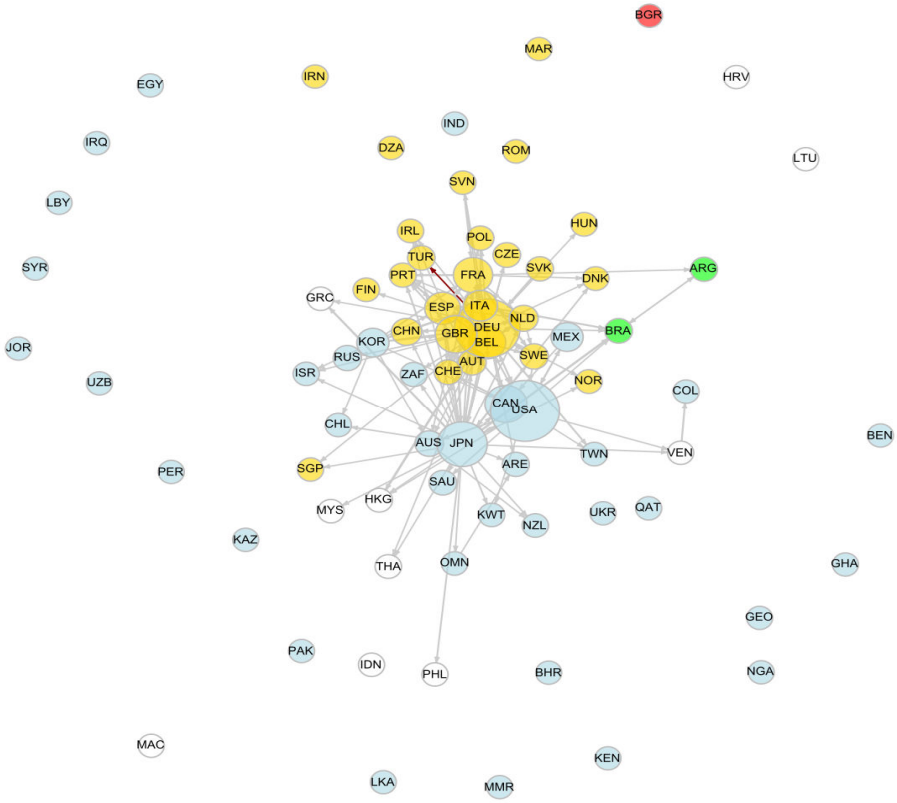


Figure A1.b: Network for Automobiles (2004-2006)

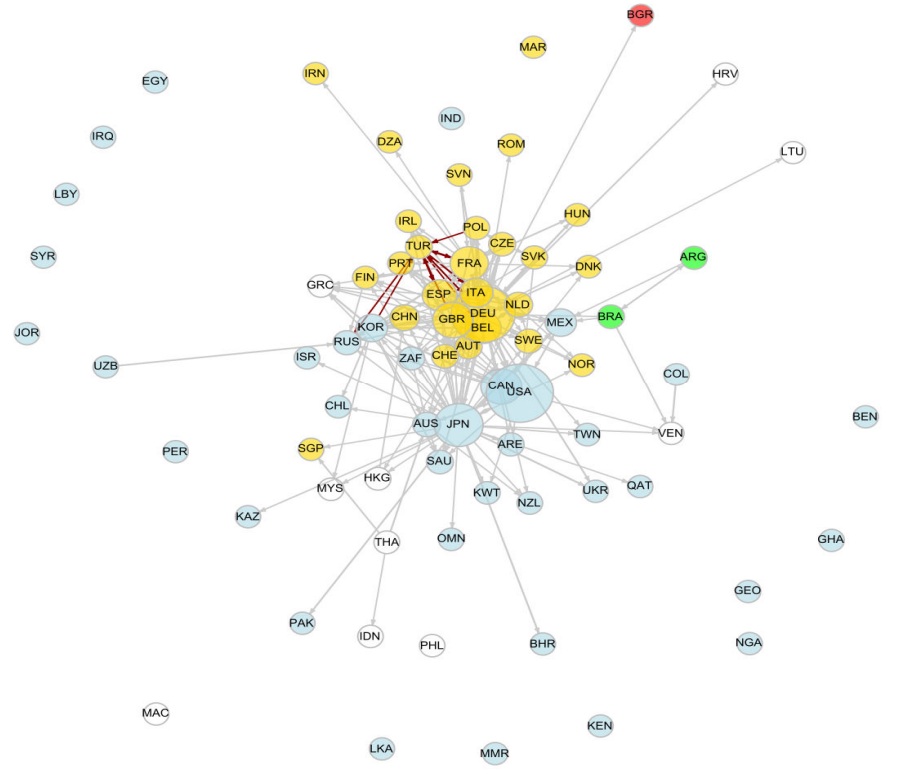


Figure A1.c: Network for Automobiles (2012-2014)

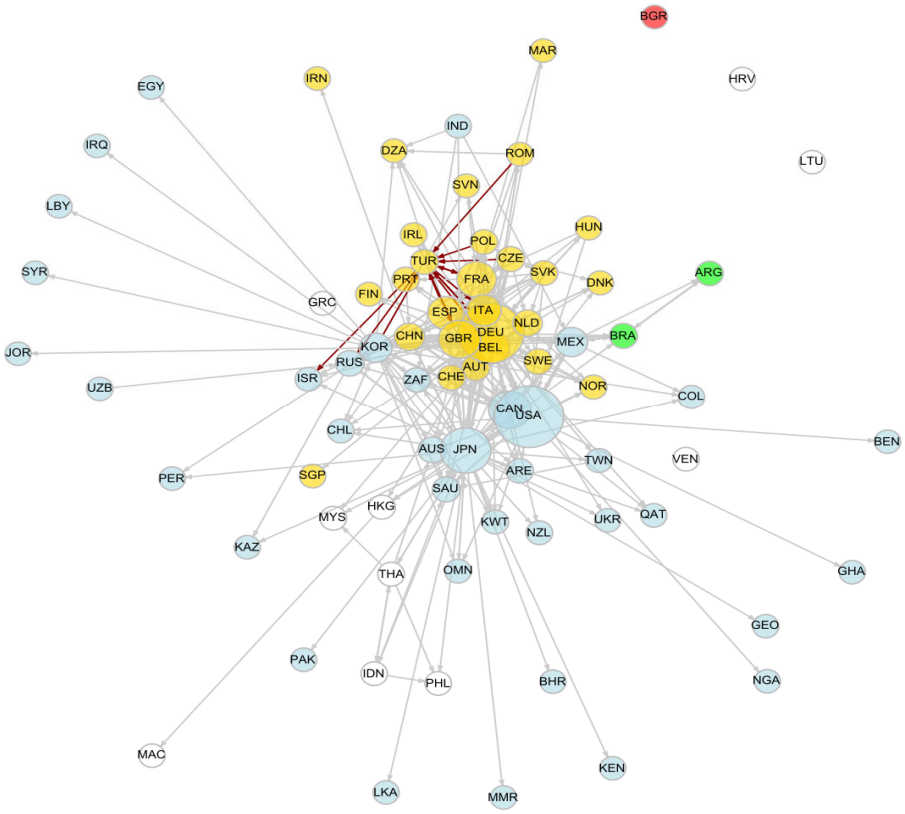


Figure A2.a: Network for Trucks, Tractors and Buses (1995-1997)

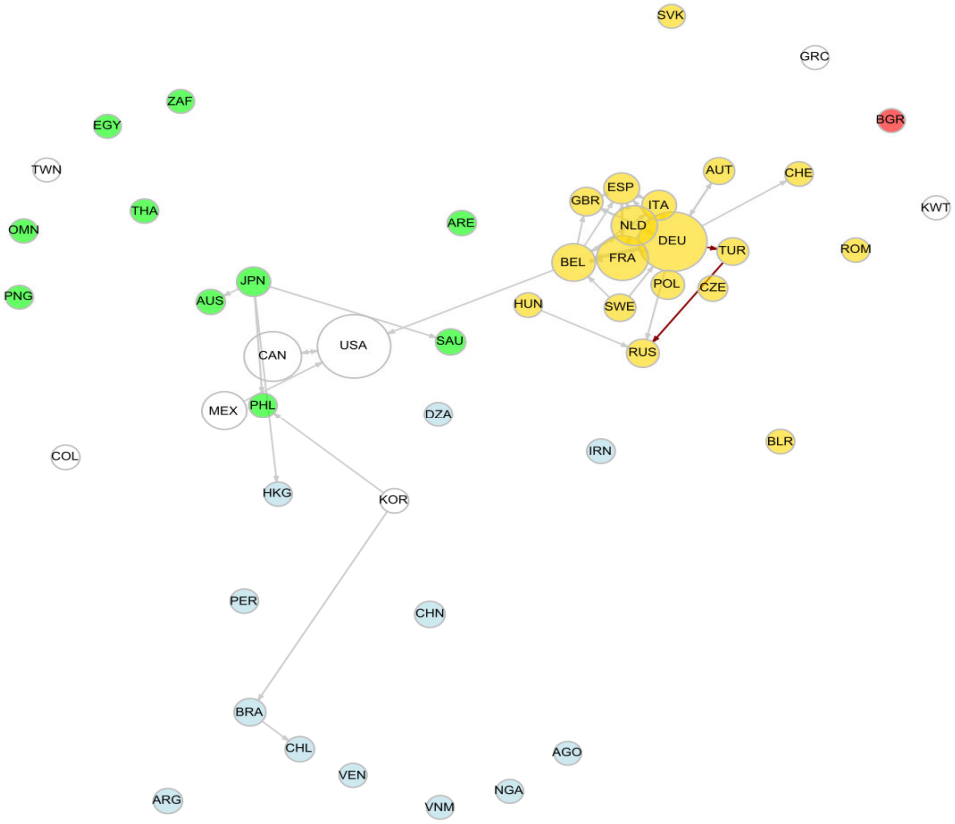


Figure A2.b: Network for Trucks, Tractors and Buses (2004-2006)

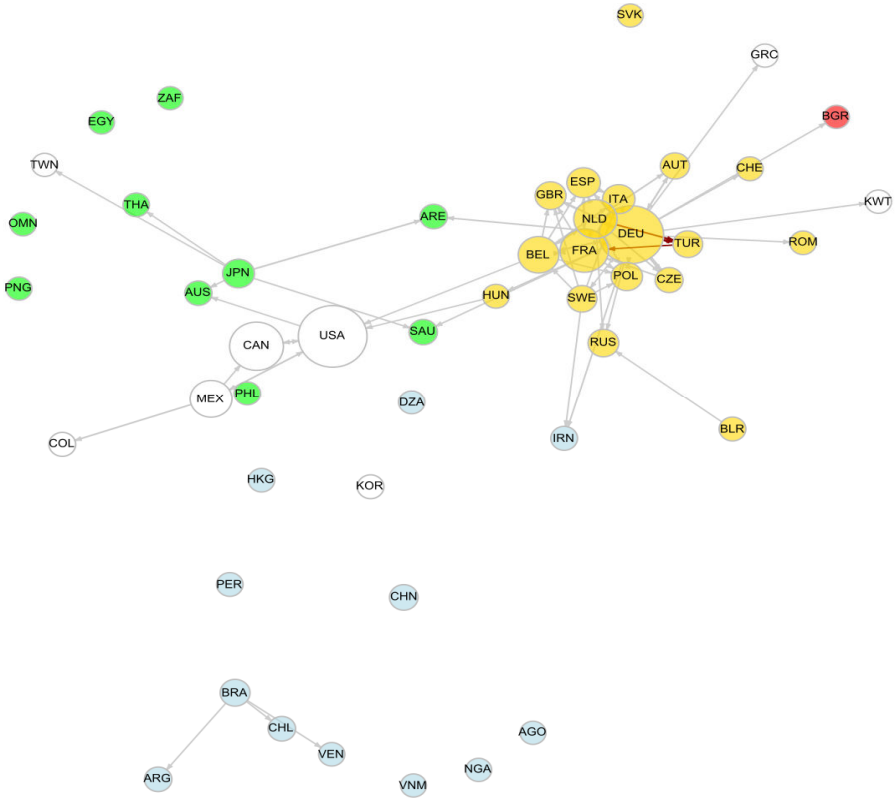


Figure A2.c: Network for Trucks, Tractors and Buses (2012-2014)

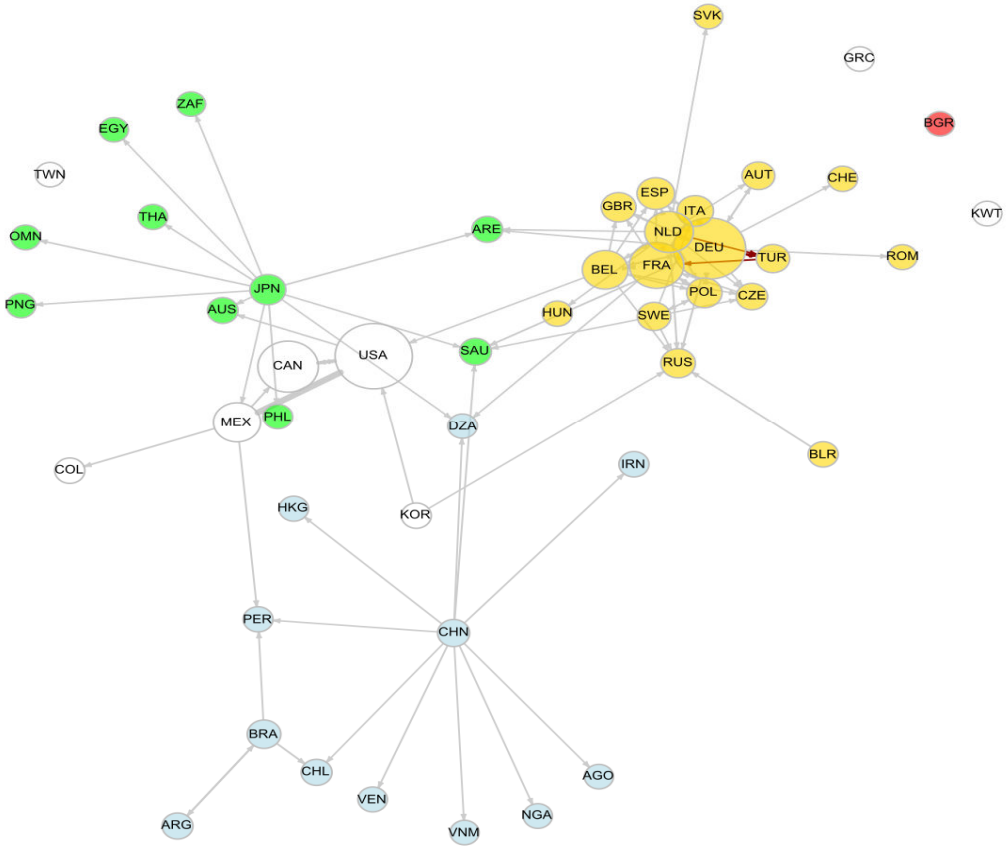


Figure A3.a: Network for Mechanical Components (1995-1997)

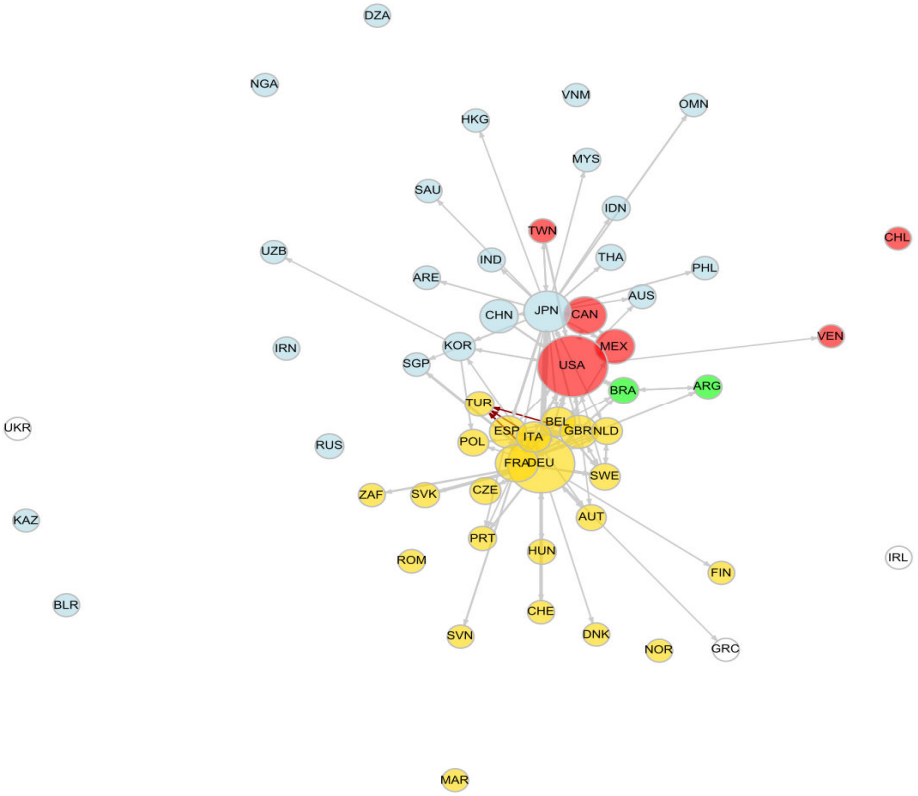


Figure A3.b: Network for Mechanical Components (2004-2006)

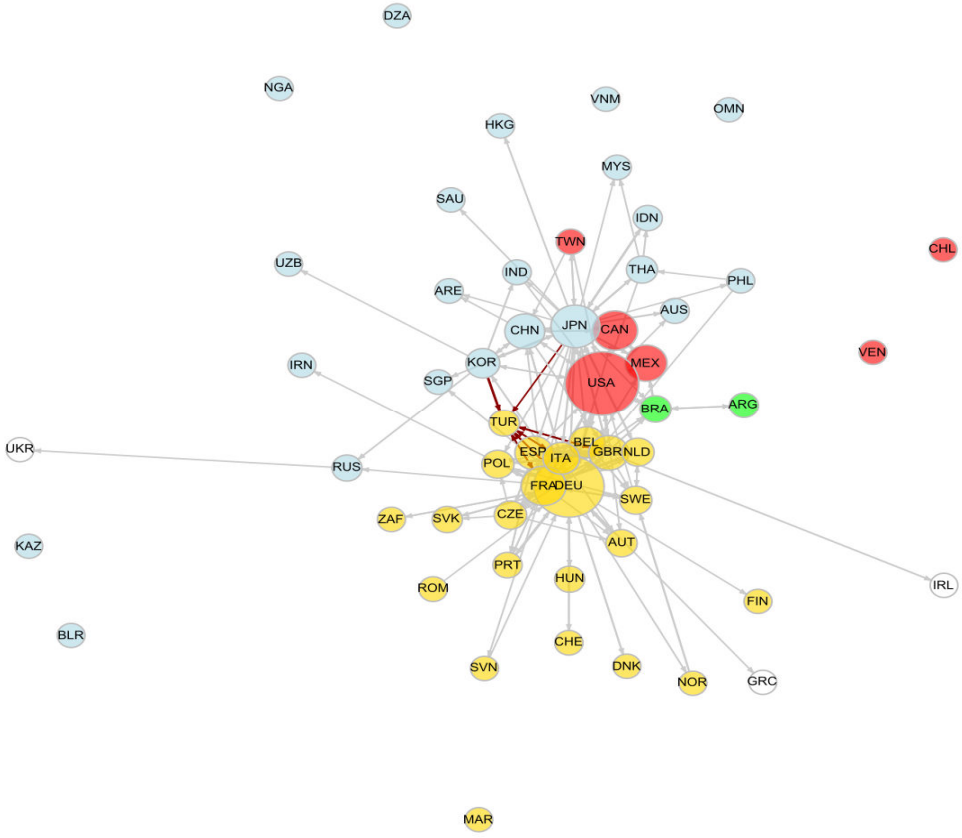


Figure A3.c: Network for Mechanical Components (2012-2014)

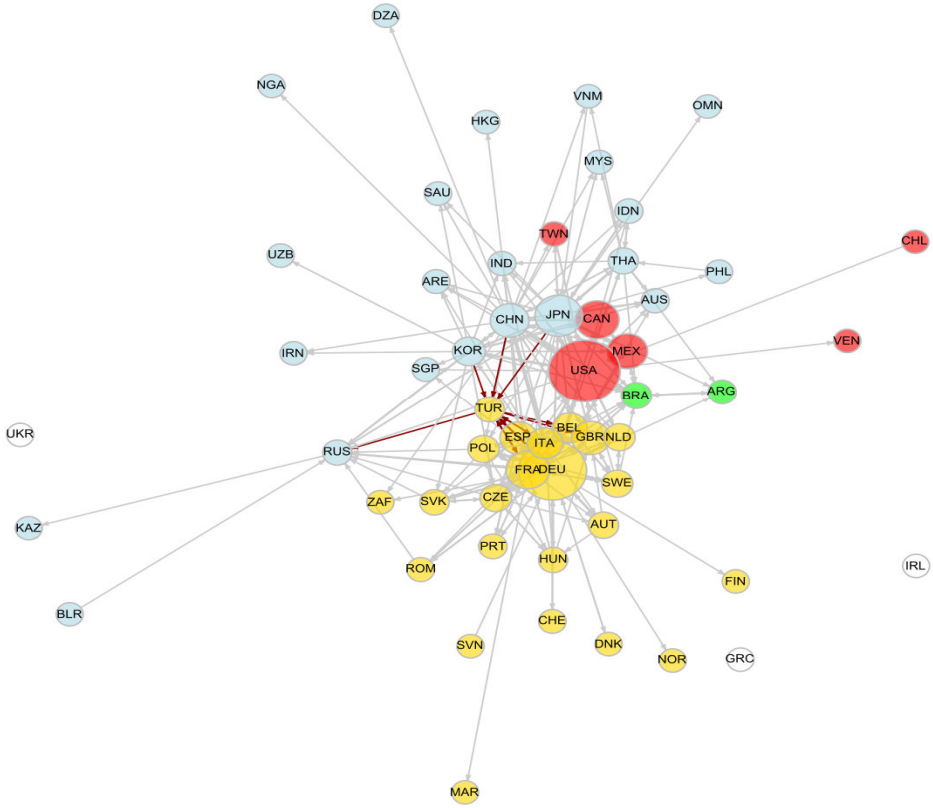


Figure A4.a: Network for Electronic Components (1995-1997)

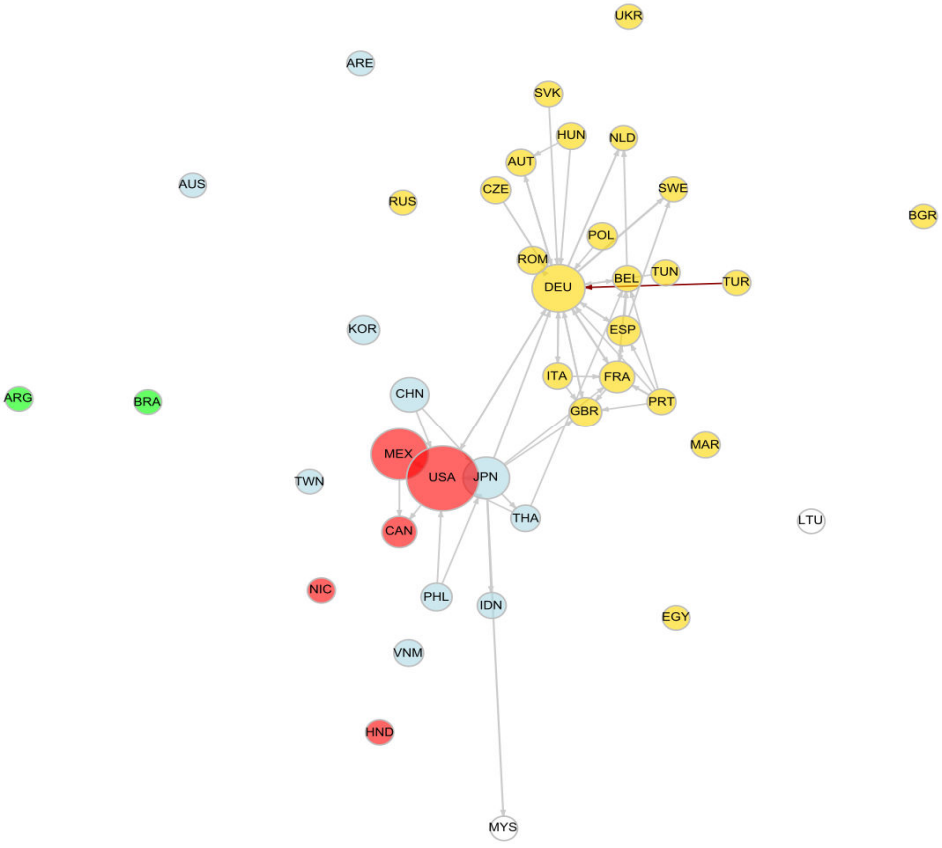


Figure A4.b: Network for Electronic Components (2004-2006)

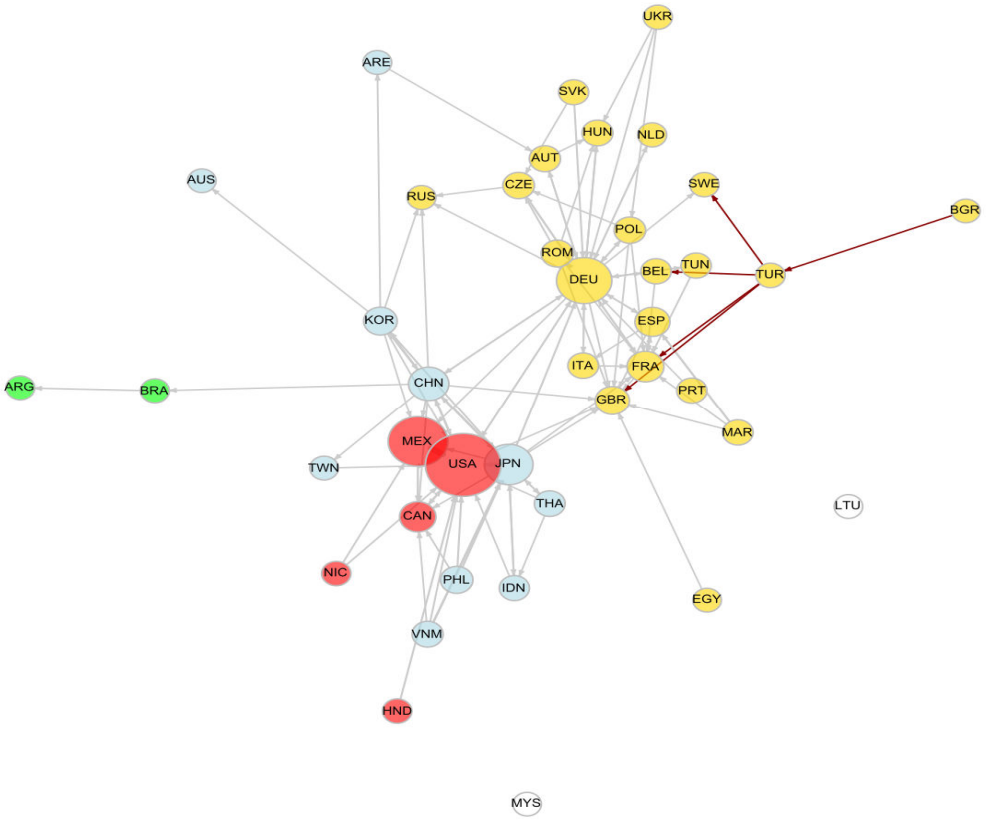


Figure A4.c: Network for Electronic Components (2012-2014)

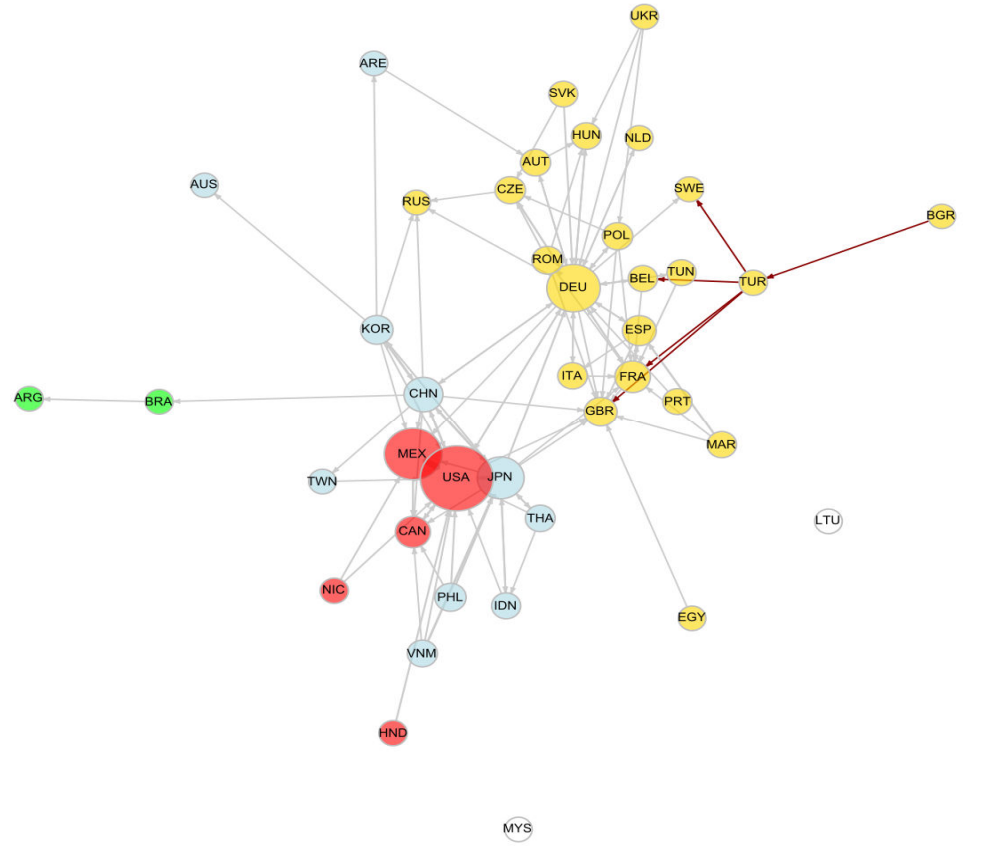


Figure A5.a: Network for Engines (1995-1997)

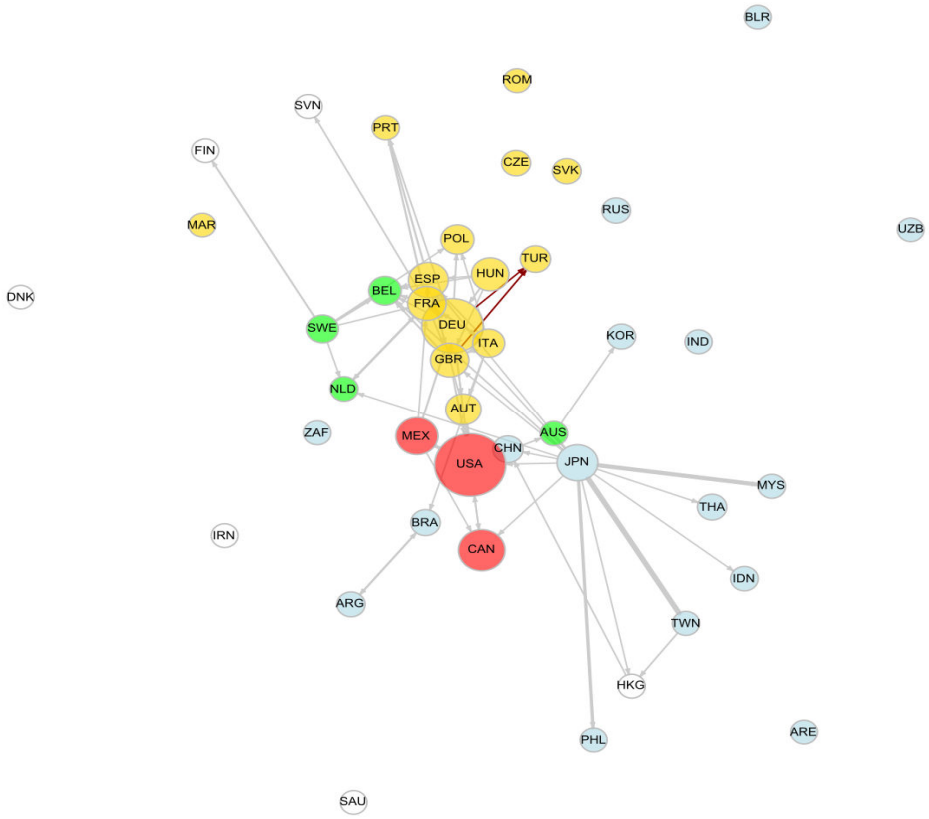


Figure A5.b: Network for Engines (2004-2006)

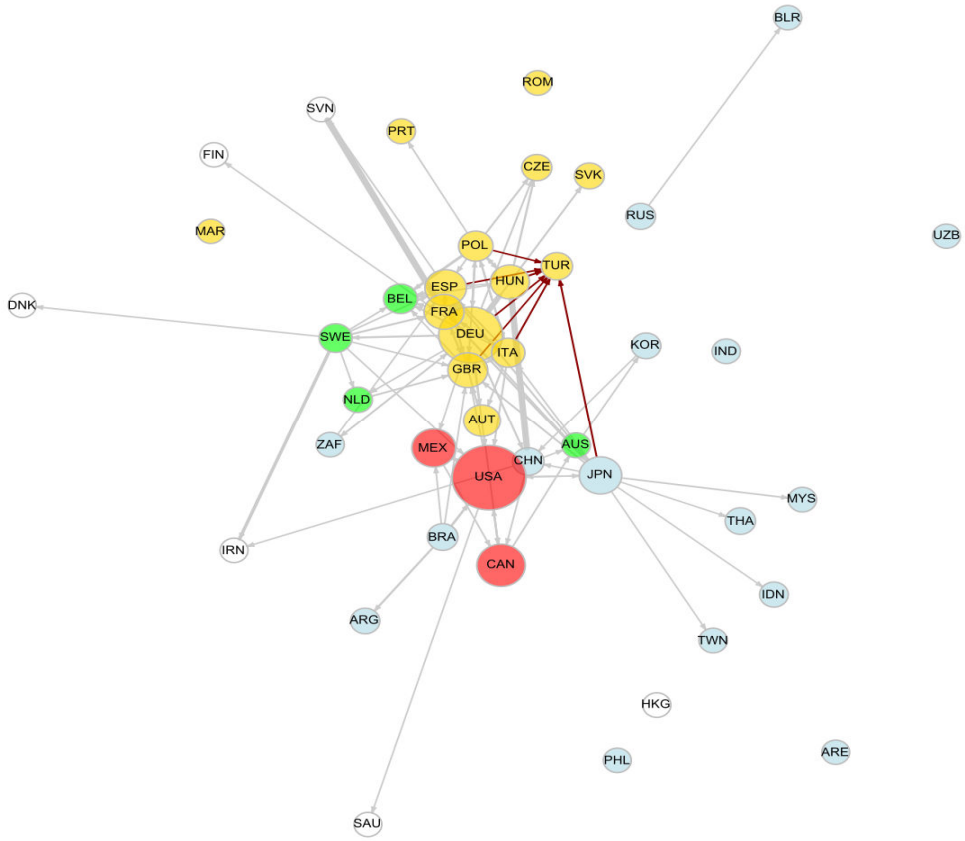
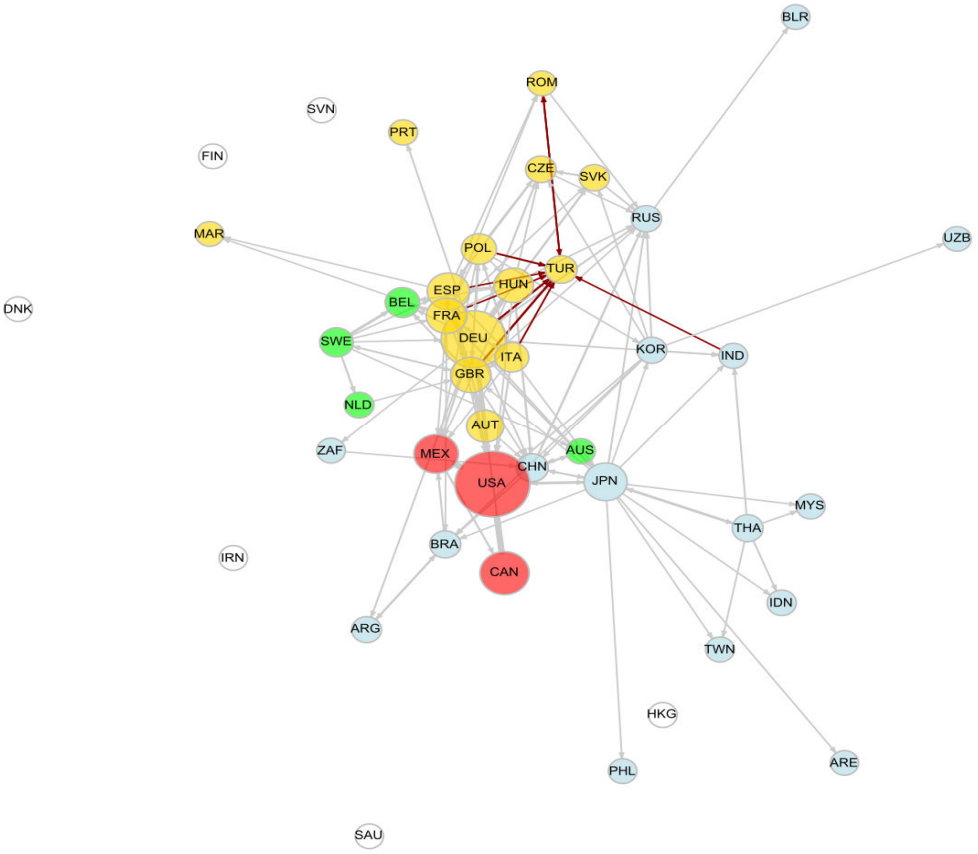


Figure A5.c: Network for Engines (2012-2014)



Abbreviations

ASMI	Annual Survey of Manufacturing Establishments
BEC	Broad Economic Categories
CU	Customs Union
EU	European Union
FDI	Foreign Direct Investment
FTA	Free Trade Agreement
FYDP	Five-Year Development Plan
GDP	Gross Domestic Product
GVC	Global Value Chain
HS	Harmonized Commodity Description and Coding Systems
ISIC	International Standard Industry Classification
LCV	Light Commercial Vehicle
MFN	Most Favoured Nation
MNC	Multinational Corporation
OSD	The Automotive Manufacturers Association (Turkish acronyms)
PTA	Preferential Trade Agreement
R&D	Research and Development
SCT	Special Consumption Tax
STS	Short Term Statistics
TAYSAD	The Association of Automotive Parts and Components Manufacturers (Turkish acronyms)
TL	Turkish Lira
TTB	Trucks, tractors and buses
TurkStat	Turkish Institute of Statistics
UK	United Kingdom
UN	United Nations
UNIDO	United Nations Industrial Development Organization
US	United States
WTO	World Trade Organization