

Historical Development in Mexico and Turkish Automotive Industries

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It is possible to say that each of the Mexican and Turkish automotive industries is developed as an assembly industry and shows great similarities to each other within this framework. However, due to its geographical proximity, the role of US-based automotive companies in the formation of the Mexican automotive industry has become greater, while the Ford Motor company, which entered the US automotive industry in Turkey, was able to take part only with the initiatives of the Otosan company in the 1960s. Another feature of the 1960s is that there were efforts to manufacture domestic cars in Turkey. Since the 1980s, in line with the direction of development of the world automotive industry, Turkey has been trying to make the country's investment environment attractive for foreign international companies to produce in their countries. In Mexico, even with the possibility of reaching new markets by providing 1990 regional agreements NAFTA ruling party of the Mexican automotive industry, we can say that U.S. firms were largely determined by the direction of development, Turkey's automotive industry development direction of the company is determined by the first European, then we can say that companies are becoming more efficient in the Far East countries. On the other hand, the US Ford Motor company considered it sufficient to be involved in the Turkey directly. Turkey has decided to return from the policy of attracting foreign investments to its country since 2006, and in 2011 it was decided to produce domestic cars. As of December 2019, a prototype of a domestic car has been produced by the Automobile Enterprise Group of Turkey and work has begun on mass production. Thus, the problem of adaptation to the production of electric vehicles was decided to be overcome by moving to a new stage on the way to technology development. This approach was used by the South Korean automotive industry in the 1980s and was successful, and the ability to develop technology was acquired in a short time. In order to see the success of the application of this method in Turkey, it is thought that it is necessary to wait for the result of the domestic automobile project. Mexico's policy of opening up more to foreign investments has been successful since the 1990s, and Mexico has become the most productive country in Latin America, surpassing Brazil in automotive industry production.

Keywords: automotive industry, backward industries, gaining the ability to develop technology, footpath connectivity, domestic automobile

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Introduction

The historical development process of the Mexican and Turkish automotive industries is similar to each other. The automotive industry of the two countries, which was established by foreign multinational automotive companies in the 1920s, tried to create its own technology development path by manufacturing domestic vehicles in the 1960s (Dolanay & Oğuztürk, 2018; en.wikipedia.org). This orientation turned into a policy of ensuring growth in the automotive industry by establishing assembly facilities of foreign automotive companies in the 1970s. In this process, while Mexico allowed foreign companies to establish automotive production facilities in its country, Turkey went on the path of expanding the automotive industry, partly with the assembly industry and partly with the domestic vehicle manufacturer Anadolu continuing production (Dolanay & Oğuztürk, 2018; Carrillo & Contreras, 2008). While the economic crises experienced by both Turkey and Mexico in the 1980s brought comprehensive economic liberalization policies to the agenda, they also brought important economic policy changes. While the 1980s passed with liberalization and implementation of new economic policies, no significant changes were experienced in the domestic automotive industry. With the 1990s, on the one hand, with Turkey's entry into the Customs Union with the European Union and Mexico's participation in the NAFTA Agreement, since 1994, foreign multinational automotive companies have preferred countries to establish production facilities in both countries. In this process, Mexico benefited well from both the advantage of its geographical location and the fact that foreign automotive companies started to establish production facilities in its country in the 1970s, and we can say that the Mexican automotive industry was able to grow more than the Turkish automotive industry.

Brief History of Mexico

In the years following the arrival of Christopher Columbus on one of the Bahamas on October 12, 1492, the Spanish expeditions continued, and in 1519 Hernan Cortez entered Mexico for the purpose of occupation and colonization. The colonial strategy that the Spanish first developed in Mexico with Cortez was very effective. According to this strategy, the most effective way to control the resistance was to capture the leader of the natives. Thanks to this strategy, the Spaniards claimed the leader's wealth and forced the native population to pay taxes and food. In the second stage, it was a question of making themselves the new elite class of society and taking control of existing practices such as taxes, tribute collection and making individuals become forced labor (Acemoğlu & Robinson, 2013, p. 19).

The military conquest of the Aztecs was completed in 1521. As the first governor of the new province of Spain, Cortez began to divide the indigenous population according to the institution of the *encomienda*. Indigenous people were forced to pay taxes and work for the *encomendero*, and the *encomendero* was obliged to convert them to Christianity in return (Acemoğlu & Robinson, 2013, p. 20).

The colonial economic elite, predominantly Spanish-born, was active as transatlantic traders and silver mine owners, and diversified their investments with land holdings. The largest segment of the population has been in the form of subsistence indigenous farmers, mostly living in the center and south. In the colonial period until the first half of the nineteenth century, agriculture was the main economic activity, with the labor of indigenous and mixed-race peasants. The Liberal Reformation of the mid-nineteenth century (circa 1850-1861; 1867-1876) sought to reduce the economic power of the Roman Catholic Church and to modernize and industrialize the Mexican economy. After a civil war and a foreign intervention, in the late nineteenth century,

during the presidential regime of General Porfirio Díaz (1876-1911), Mexico opened up to foreign investment and, to a lesser extent, foreign workers. Foreign capital has established a rail network that is one of the keys to transforming the Mexican economy, connecting Mexican regions, major cities, and ports. Regional civil wars broke out in 1910 and lasted until 1920. Following the military phase of the revolution, Mexican regimes sought to “turn a largely rural and backward country into a medium-sized industrial power” (Woinczek, 1986, pp. 282-300). The lands were distributed to the peasants. Between 1946 and 1970, there were years of economic growth with the import substitution industrialization model (en.wikipedia.org).

In the late 1970s, large oil reserves were discovered in the Gulf of Mexico, and Mexico borrowed heavily from foreign banks with loans in US dollars. When the price of oil fell in the 1980s, Mexico experienced a severe financial crisis (en.wikipedia.org).

From 1978 to 1981, oil revenues and foreign loans helped fuel an unprecedented boom in the Mexican economy, with real gross domestic product (GDP) growing more than 8% per year (Bird, 1996, p. 3).

The current account deficit widened to \$16 billion (6.4% of GDP), with oil and gas accounting for nearly 80% of total exports. We can say that this high growth rates for three years was turned to a lower growth rates with 1982 according to previous three years period growth rates with the weakening of the international oil market and the decline in foreign loans, which pushed Mexico into a deep recession and triggered the international debt crisis (Bird, 1996, p. 3).

However, this economic expansion has been unstable and has caused serious internal and external imbalances. In 1981, the budget deficit reached 14% of GDP and public external debt increased by \$20 billion, mostly short-term. We can say that this high growth rates period for three years turn to a lower growth rate year in 1982 with the weakening of the international oil market and the decrease in foreign loans, pushing Mexico into a deep recession and starting the international debt crisis. Mexico’s initial policy response included nationalization of its banking system, extensive import restrictions, cuts in public spending, a moratorium on foreign debt payments, full-fledged exchange rate controls, and a major adjustment to the dollar-peso parity. However, by mid-1982, foreign reserves were nearly depleted, productive activity remained stagnant, and external liabilities exceeded Mexico’s ability to pay (Bird, 1996, p. 3).

In December 1982, a new administration took office and set up a stabilization program based on the assumption that Mexico’s difficulties were a result of its inward-looking development model and excessive government intervention in the economy. The goals of the program were to reduce inflation, overcome the balance of payments crisis, and transform Mexico’s productive structure, strengthening the role of markets and the private sector. The government’s stabilization program followed orthodox principles: (i) fiscal and monetary austerity aimed at reducing the amount of domestic money, and (ii) exchange rate policy aimed at changing relative prices. Although some positive results were obtained in 1984-1985, the fall in oil prices in 1986 caused balance of payments problems, accelerated inflation and a decrease in per capita income. In December 1987, with annual inflation reaching around 160% and productive activity receding, a new program was launched: The government established the Economic Solidarity Pact (ESP) with an agreement between the business sector and trade unions, approved a program of fiscal and monetary austerity, along with a freeze on wages, prices, and the exchange rate (Bird, 1996, p. 3).

Subsequent administration (Carlos Salinas de Gortari 1988-1994) continued in the same way. Stabilization strategy annually revises the ESP and makes very minor changes. It came into question and then the almost

stagnant exchange rate started to fluctuate in a gradually widening band. Thus, intensive deregulation and privatization became important for the restructuring of the economy. From 1989 to 1993 the banking system and public enterprises, including more than 800 steel and copper mining companies, airlines, and telephone, were sold to the private sector. Inflation decreased, net foreign capital inflows resumed, non-oil exports increased, and moderate economic expansion was achieved. Since then, however, its performance has dwindled, and the decline in inflation has been associated with a decline in economic growth. In fact, Mexico repeats the typical cycle of the stabilization programs they are based on. Although NAFTA was expected to attract sufficient foreign capital, there were widening trade and current account deficits, appreciation of the real exchange rate, dependency on short-term capital inflows attracted by high interest rates, and decreased private savings (Bird, 1996, p. 4).

Under President Carlos Salinas de Gortari, Mexico campaigned to join the North America Free Trade Agreement (NAFTA), which entered into force on January 1, 1994 between Mexico, the United States, and Canada. Mexico implemented neo-liberal economic policies and changed important articles of the Mexican Constitution. In the twenty-first century, Mexico has strengthened its trade ties with China, but Chinese investment projects in Mexico hit roadblocks in 2014-2015. Mexico's continued dependence on oil revenues had a detrimental effect when oil prices fell, as they did in 2014-2015 (en.wikipedia.org).

Mexican Automotive Industry Between 1900-1995

The biggest US auto companies have had an important economic role in Mexico. These companies entered the automobile industry in the country and still carry out most of the production. Ford of the USA was the first automobile company among the Big 3 that started production in this country in 1925 (Carrillo & Contreras, 2008, p. 383). General Motors started automax operations in the country in 1938, and Chrysler entered the country market in the following years (1top.company>en>the-automotive-industry-in-mexico-background-curren-t-situation).

In 1903, motor cars first arrived in Mexico City, a total of 136 cars were seen that year, and by 1906 the number had risen to 800. This prompted the government to create the first Mexican highway code (which would allow cars to move at maximum speed). Thus, the rule of driving at 10 km/h or 6 mph in crowded or small and narrow streets and 40 km/h or 25 mph elsewhere has been adopted. In 1910, Daimler and Renault set up small plants for local vehicle assembly for the Mexican government, but these plants were only able to operate for a little more than a few months before they were destroyed in the Mexican Revolution. Shortly after the end of the armed struggle, Buick became the first automaker officially established in Mexico, beginning in 1921. The Ford Motor Company was founded in 1925. In 1961, Mexico produced its first completely domestic vehicle with a small truck called the Rural Ramírez, manufactured by the Ramirez truck company (en.wikipedia.org).

Many assembly car manufacturers were already in operation by 1961, when the first economic crisis broke out in the Mexican economy. In the early 1960s, government regulations forced auto companies to assemble cars in Mexico using both local and imported components. The aim has been to develop a national automobile industry in the country, promoting employment and technological developments. Companies that do not comply with these regulations have left the country; these included Mercedes Benz, FIAT, Citroën, Peugeot, and Volvo. General Motors, Ford, Chrysler, American Motors, Renault, Volkswagen, Datsun, and Borgward remained (en.wikipedia.org).

The government rearranged the tax on automobile ownership to cover the construction costs of the new facilities for the 1968 Summer Olympics to be held in Mexico; it was called Tenencia Vehicular, but the tax was also used to finance the 1970 FIFA World Cup. Ironically, the tax was in question in most states until 2012. When purchasing a new vehicle, there is also a second tax, depending on the features and cost of the vehicle. Unlike Tenencia, this tax is paid only once (en.wikipedia.org).

Auto companies of USA have had an important economic role in Mexico Automotive Industry. These companies entered the automobile industry in the country in 1920s and 1930s and still carry out most of the investments for increase production. Ford of the USA was the first automobile that started production in this country in 1925. General Motors started Automax operations in the country in 1938, and Chrysler entered the country market in the following years ([1top.company>en>the-automotive-industry-in-mexico-background-current-situation](http://top.company>en>the-automotive-industry-in-mexico-background-current-situation)).

Mexican Automotive Industry After 1995

The growth of the Mexican economy in the late 1990s stimulated automobile sales in Mexico, and eventually automakers who had previously exited the country returned to the market. Manufacturers such as Honda and Porsche first arrived in the last years of the 20th century, while others such as Peugeot and Mercedes-Benz gave Mexico a “second chance” from 1997 onwards. Annual passenger car sales in Mexico reached one million milestones in 2005. Increasing sales figures have encouraged automakers to offer alternative fuel cars such as the Honda Civic Hybrid and Volkswagen Jetta TDI. Such cars have not been available in Mexico since the first diesel-powered Volkswagen Caribe in the late 1970s and early 1980s. Due to stricter government emissions laws than the European Union Euro IV standard, only a few automakers are still able to launch their diesel-powered versions in the Mexican market. Diesel powered cars are not allowed for daily driving in Mexico City; new diesel vehicles face “Hoy no Circula” restrictions (en.wikipedia.org).

Delphi Automotive Systems split from GM in 1995 and became fully independent in 1999. By 2001 it employs more than 193,000 people worldwide and operates 198 production facilities, 53 sales, and service centres, 31 technical centres, 44 joint ventures and has units in 43 countries. The firm’s role in Mexico has grown since its first factory in 1978. One-third of Delphi’s worldwide operations are located in this country. However, their importance is not only due to their economic and social contributions. Its role in other aspects such as R&D, technology development, a lean organization, supply chain, workforce skills, and participation in regional development is very important. Although the trajectory of Delphi in Mexico has been long, it has clearly established an industrial upgrading and learning process. Delphi’s growth as an employer has coincided with the upgrade of the firm’s operations in Mexico from simple assembly to centralized manufacturing. Coordination of functions, including sophisticated product design, research and development (R&D), comes into question. This change has enriched the workplace activities in some of Delphi’s factories and, more importantly, facilitated the establishment of the first internal communication network. Technical centers and production facilities in Mexico’s export industry are institutionalized (Carrillo & Contreras, 2008, p. 385).

On July 2, 1995, with an initial investment of \$150 million, Delphi opened Mexico’s first research, design, and development technical center in Ciudad Juarez, which was transferred from Anderson, Indiana. This strategic decision has created a strategy that reduces production cycles, delivery time, and overall costs. According to the interviewed managers, there were three main reasons for the location selection. First, the

location is convenient. At the center on the Mexican side, just across the El Paso border, US employees were able to work and live in the US. Second, Delphi's factories in Juarez have the backlog of 15 years of corporate learning that will integrate well with a technical center. Finally, the quality and competence of Mexican engineers has enabled Delphi to reduce costs without sacrificing quality. In addition to the State of Chihuahua, many public and private institutions have supported the educational infrastructure to train engineers. Additionally, the abundance of assembly plants in the area has ensured a steady supply of engineers, many of whom seek to find themselves in supervisory roles and desire opportunities to use their engineering skills. MTC initiated part of three structural changes in the automotive sector (Carrillo & Contreras, 2008, p. 388):

1. transition from an integrated design to a modular one,
2. global supply creation,
3. continued increase in the electronic content of automobiles.

These general factors worked in a particular way in Mexico, allowing synchronization of R&D and manufacturing activities at the regional and global scales (Carrillo & Contreras, 2008, p. 388).

The North American Free Trade Agreement (NAFTA), which encompassed the United States, Mexico, and Canada and entered into force in 1994, has accelerated the further expansion of a regional production system by removing interregional taxes and imposing higher barriers for foreigners. Between 1988 and 1998, automobile production in Mexico increased by 130 percent from 629,000 to 1,453,000 units. In 2000, production reached 1,889,486 units and fell to 1.5 million four years later, but has climbed steadily since then, setting historical records of 2,105,789 and 2,180,294 units for 2007 and 2008, respectively. Then the crisis broke out and total production fell to 1,566,842 units in 2009 and production decreased by 28.3 percent. Recoil was quicker and significantly stronger. At the end of 2010, production in Mexico reached 2,260,776 units. In short, what we've seen in these three years is this: The crisis took a little longer to reach Mexico and conversely, the recovery took much less time. It is more important to note that the recovery has been as dramatic as the crisis and that Mexico has taken finished vehicle production to new heights. Such remarkable swings in automobile production may imply that from the outset the productive and market trajectory of automakers, and thus of the auto industry as a whole, is becoming more and more. However, it's safe to say that auto companies are rapidly escalating Mexico as a critical asset to prevail in the North American region while surviving the crisis and maintaining their own market share. Meanwhile, more than half of domestic sales came from imports, with the Mexican domestic market increasingly dependent on imports, remaining weak and stagnant. In 2010, both domestic and imported light vehicle sales increased by 7.3 percent (equivalent to approximately 810,000 units) and heavy truck sales increased by 13 percent (close to 26,000 vehicles). However, these figures were 21 percent and 45 percent lower, respectively, compared to 2008. Moreover, the Association of Mexican Auto Dealers said that if these "slow growth" trends continue in 2011, national auto sales will only "be at levels similar to 2000" and will continue to be—as expected—in fact (Covarrubias, 2011, pp. 121-122).

At the beginning of the 2008 world economic crisis, Mexico was in a position to produce for the regional market. Of the nearly 24 automakers, 80 percent have been producing mainly for export to the USA. Exports of GM, Ford, and Chrysler accounted for 70 percent of total exports to the United States. The remainder of the exports were split between four other automakers based in the country: These are: Japan's Nissan, Toyota, and Honda companies, and Germany's Volkswagen companies. In the pre-crisis years, most of the production for export consisted of medium and large segment vehicles. While GNP decreased by 7 percent in 2009, the

contribution of the automobile sector to GNP decreased to 2.7 percent and its share in manufacturing GNP to 15 percent. Meanwhile, factory closures and layoffs reduced the workforce by 10 percent. During the crisis, Nissan replaced GM as Mexico's leading automaker, but did not stay at the top for long. By 2010, GM had reclaimed its place as the largest manufacturer, followed by Nissan, VW, Ford, and Chrysler. Honda and Toyota took the bottom line, with a modest production of around 50,000 vehicles each (Covarrubias, 2011, pp. 122-123).

Ford has not stopped expanding its investment plans in the country during these years of economic crisis. Due to its less limited financial resources than GM and Chrysler, and its plans to strengthen its position in Mexico from 2005 onwards, Ford has ensured that both its planned and new investments work together in a balanced way. In fact, ever since the Ford Hermosillo plant (HSAP) in northern Mexico was refitted in 2005 for the release of the Lincoln MKZ and Mercury Milan variants, several models based on the Ford Fusion and CD3 platform project, Ford has made it clear that Mexico has been a keystone in its global life. Let's say it's revealed. The factory, which was opened in Guanajuato for transmission production, was another investment of Ford in Mexico (Covarrubias, 2011, pp. 123-124).

Then came the Ford CD4 platform project. An additional US\$1.5 billion investment in the Hermosillo Plant (HSAP) was required to launch Ford's next-generation mid-size sedans, which became 2013 models, as early as 2012 (Covarrubias, 2011, p. 125).

Automotive industry total production increased to 2,681,050 units in 2011, to 3,001,814 units in 2012, to 3,054,849 units in 2013, to 3,368,010 units in 2014, 3,565,469 units in 2015, 3,597,462 units in 2016, 4,068,415 units in 2017, and 4,100,525 units in 2018. There was a decrease in production numbers on an annual basis. The total production of the Mexican automotive industry was 3,986,794 units in 2019 and 3,176,000 units in 2020. Despite the declines in the total production of the automotive industry in the last two years, the Mexican automotive industry ranked 7th in the world automotive industry production with the developments it has made in the ten years after 2008, and Mexico's place in the ranking has not changed despite the decrease in production in the last two years (www.oica.net).

Brief History of Turkey

Since the establishment of the Ottoman Empire, great importance has been attached to science and has been sensitive about the transfer of knowledge and technology (İnalçık, 2017; Dolanay & Oğuztürk, 2019; Dolanay, 2021a; 2021c). As a matter of fact, the first Ottoman Madrasa was established by Orhan Gazi in 1331 in İznik (Özilgen, 2009, p. 21; Dolanay, 2021a, Dolanay, 2021c). However, after the execution of Molla Lütfi, one of the important scholars on mental sciences, in 1495, with the decrease in the importance given to mental sciences, the process of knowledge and technology transfer began to be interrupted (Dolanay & Oğuztürk, 2019; Zelyut, 2019; Pala, 2019; Dolanay, 2021a; 2021c). Due to the defeats in the wars, the transfer process was tried to be revived by the trainers brought from abroad in the military field, and a hendesehane (geometry school) was opened in 1734 by Comte de Bonneval (Özilgen, 2009, p. 40; Dolanay, 2021a; 2021c; 2021e; 2021f) and this school was supported by the ilmiye class (Cihan, 2014, pp. 140-145; Dolanay, 2021a, p. 81; 2021c, p. 78). The Ottoman Academy of Sciences was established in 1862 and Dar ülf ünun, which would later be accepted as a University, was established in 1863 (Özilgen, 2009, p. 63; Dolanay, 2021a, p. 82; 2021c; 2021e; 2021f).

In 1924, Madrasahs, which could be called the main pillar of the Ottoman education system, were closed (Zengin, 2002; Cihan, 2014; Dolanay, 2021e; 2021f). With the University Reform carried out in 1933, the institution of Dar ılf ünun, which was able to establish a connection with the past knowledge once again and was formed with the knowledge gained from the Madrasa, was completely removed, and universities were established, which were required to provide education in Western norms. New trainers, mostly of foreign origin, were brought in place of the trainers. In addition, the Faculty of Language, History and Geography was established in 1935, which was understood to be aimed at completely erasing the knowledge of the Ottoman education system and aiming to create a new history thesis (Erdem, 2012, pp. 380-386; Dolanay, 2021c; 2021e; 2021f). The dismissal of faculty members from the university in certain periods also took place in the later years of the Republic. Thus, universities remained as institutions that transfer knowledge from abroad to teach their students (Dolanay, 2021c, p. 78; Dolanay, 2021e; Dolanay, 2021f).

In the system, which was implemented before 1838 and called Yed-i Vahit, the state was able to leave the trade and especially the export of a commodity in any region to a private person. In addition, the state was able to prohibit the export of this commodity during periods when there was a shortage of certain goods or foodstuffs. Before 1838, the Ottoman Empire had 3% customs duty on both exports and imports, and the internal customs tax rate was 8%. On 16 August 1838, in the mansion of Grand Vizier Reşit Pasha in Balta Harbor, the Balta Harbor Trade Agreement was signed between Reşit Pasha and the British Ambassador Possenby. With the agreement, the customs duty on exports was reduced to 12% and the customs duty on exports was reduced to 5%. While internal customs duties were abolished for foreigners, they continued to be applied to domestic traders. The customs duty on imports was increased to 8% in 1861, 11% in 1905, and 15% in 1908. Thus, we can say that the Ottoman State agreed to determine its own customs duties together with the European States (Pamuk, 1994, pp. 17-19; Dolanay, 2021e; 2021f).

Thus, the Ottoman Empire started to block the way of its own industrialists and entrepreneurs, which caused the entrepreneurs to focus only on trade. When the decline in industrial entrepreneurship combined with the decline of rational sciences in the field of science, the country began to have a state structure that only imports industrial products and exports raw materials without gaining profit. For this reason, the domestic automotive industry could not be formed, and after the Republic, foreigners were asked to establish the automotive industry in the country (Dolanay, 2020, p. 543; 2021b, p. 57; 2021e; 2021f).

Turkish Automotive Industry Between 1923-1960

At the Izmir Economy Congress convened in 1923 after the War of Independence, it was decided that rapid industrialization would be provided by the private sector, and that the state would intervene in cases where the private sector's capital was not sufficient. In this context, an assembly facility was established in 1929 by Ford Motor Company in Istanbul Tophane to produce trucks and automobiles. However, this facility was closed in a short time due to the world economic depression and hostility to foreign capital (Pamuk, 1994, pp. 17-22; Keyder, 1993, pp. 80-84; Dolanay & Oğuztürk, 2018; Dolanay, 2021e; 2021f). We can say that the automotive industry started to produce again with the military jeep assembly facility under license in the 1950s (Dolanay, 2021c, p. 79; 2021d, p. 238; 2021e; 2021f).

Although the process of establishing a national industry gained importance after 1923, the number of companies with foreign partners increased rapidly with the declaration of the Tanzimat Fermanı and we can say that the Encouragement-i Industry Law of 1913 was beneficial for companies with foreign partners (Erdaş,

2015). As a matter of fact, Franko ve Şürekasi Inc.Co., which was a foreign partner company, was understood that one of them was beneficial company (Dolanay, 2021d, p. 238; 2021e; 2021f).

Bernar Nahum, who played an important role in the establishment of the automotive industry in Turkey, was founded in 1928 as Franko ve Şürekasi A.Ş. He started to work within his organization and his supervisor was Joseph Kohen (Nahum, 1988, pp. 11-12; Dolanay, 2021d, p. 238; 2021e; 2021f).

Turkish Automotive Industry Between 1960-1980

In 1961, for the first time in the world, Turkey's first domestic automobile prototype, Devrim, was manufactured in the locomotive workshop in Eskişehir in a short period of four months. However, the mass production of Devrim could not be started (Şimşek, 2006; Dolanay & Oğuztürk, 2018). In 1960, Ford automotive products started to be produced in Otosan Koç Group Company under the leadership of Bernar Nahum (Nahum, 1988, p. 118). In 1967, the production of Anadol cars was started by the Koç Group with the multiple license method. This initiative of the Koç Group did not turn into a continuous and permanent success story due to the fact that exports were not considered and the bodywork was manufactured from the wrong material. In 1971, TOFAŞ with the Italian Fiat license and OYAK Renault facilities with the French Renault license were established (Dolanay & Oğuztürk, 2018; Dolanay, 2021c; 2021d, p. 238; 2021e; 2021f).

With the TOFAŞ Bird series, production of which started in the 1970s, it was possible to move to the stage of creative imitation in a sense, but there was no development that could turn into innovation later (Küçükerman, 2000; Dolanay & Oğuztürk, 2018; Dolanay, 2021a, p. 83; 2021c, p. 80; 2021e; 2021f).

It was thought that this was due to the lack of sufficient knowledge that could lead to the acquisition of technology development capability (Dolanay, 2021a, p. 83; 2021d, p. 239; 2021e; 2021f).

Turkish Automotive Industry Between 1980-2000

In the 1980s, all automobile manufacturers diversified their products and tried not to be affected by the economic crisis that took place in 1980 (Dolanay & Oğuztürk, 2018; Dolanay, 2021e; 2021E).

In the 1980s and especially in the 1990s, many documents on science and technology were produced. However, little has been done to ensure scientific and technological development. The objectives set out in the documents were generally not achieved (Göker, 2013; Dolanay, 2021e; 2021f).

In the 1990s, production facilities were established in Turkey by Honda, Toyota, and Hyundai companies, and with the Customs Union with EU countries in 1994, automobile exports from Turkey to EU countries increased (Dolanay & Oğuztürk, 2018; Dolanay, 2021e; 2021f).

Turkish Automotive Industry After 2000

After the economic crisis experienced in 2001, serious annual economic growth rates were achieved in Turkey from 2002 until 2008. This period was also a period in which the results of the Customs Union and OEM investments of foreign companies began to be seen in the automotive industry (Dolanay & Oğuztürk, 2018; Dolanay, 2021e; 2021f).

However, when Hyundai could not get the incentives it wanted for the second factory it wanted to establish in 2006, it could not come to an agreement with Turkey and made this investment in the Czech Republic (www.hurriyet.com.tr). Thus, there has been a policy change in the Turkish automotive industry and Turkey has decided to produce its own domestic automobile. Although this policy change emerged as an idea in

2011, it could only give results in December 2018 and domestic automobile prototypes were introduced by TOGG. In July 2020, the foundation of the factory was laid (www.linkedin.com; www.odd.org.tr; Şimşek, 2020, pp. 202-205). Ford Otosan aims to increase its production capacity from 440 thousand vehicles to 650 thousand vehicles in 2021 with its new investment decision. All of the vehicles to be produced with the new investment are designed as electric and hybrid, and the company plans to continue to export 90% of its production. With this investment, a battery capacity of 130,000 was also achieved. It was thought that this investment decision was made as a result of the decision to produce electric domestic cars and thanks to the policies supporting the entrepreneur (www.okuhaber.com; Dolanay, 2021e; 2021f).

Starting from 1867, Uzel company, which had produced horse-drawn carriages with mass production technique in Ruse and in Bursa in the 1870s, continued its production as a part manufacturer and tractor assembly company in the following years, while in 2009 it succeeded in producing the first domestic tractor. However, this innovative and entrepreneurial company could not escape from bankruptcy in the following years (Dolanay & Oğuztürk, 2018, p. 216; www.hurriyet.com.tr; www.haberler.com>Ekonom; Dolanay, 2021e; 2021f). Again, Tata Motor, which planned to establish a production facility in Turkey in 2009, could not achieve this (<https://tr.wikipedia.org>). In February 2011, the desire to produce domestic cars was notified to the companies by the government. Again, the first domestic electric car, the prototype of which was manufactured in the Hacettepe University technopark in 2015, could not find sufficient support, so mass production could not be started and the project suffered the fate of the Devrim cars project and was cancelled (www.youtube.com; Dolanay, 2021e; 2021f).

The inadequacy of Turkey's science, technology, and innovation capacity is also due to the effect of its historical past (Dolanay & Oğuztürk, 2019) However, with the decrease in the importance given to mental sciences after the execution of Molla Lüfi, one of the important scholars of mental sciences, in 1495, the process of knowledge and technology transfer began to be interrupted (Dolanay & Oğuztürk, 2019; Zelyut, 2019; Pala, 2019; Dolanay, 2021e; 2021f).

General Evaluation

While the total production of the Mexican automotive industry was 1,935,527 units in 2000 and 2,342,282 units in 2010, it increased to 3,565,469 units in 2015 and increased to 3,986,794 units in 2019 (www.oica.net) However, the production figure decreased to 3,176,000 units in 2020 (www.oica.net). It is thought that this decrease in production is due to the effect of the corona virus epidemic.

Total production of the Turkish automotive industry was 1,072,978 units in 2010, 1,358,796 units in 2015 and 1,297,878 units in 2020 (www.oica.net).

While Mexico's production values have increased continuously from 2000 to 2019, Turkey's production values have followed a fluctuating course. We can say that the change in the production strategy of some international automotive manufacturers after the 2008 economic crisis, together with NAFTA, has been effective in the development of the Mexican automotive industry.

While the Mexican automotive industry developed slowly with the effect of the government's import substitution and protectionist economic policies in the 1960s, automotive industry production increased as a result of the Mexican industry's opening towards foreign markets in the 1990s, production values reached its highest point in 2019, but with the effect of the corona virus epidemic, 2020 Mexico's automotive industry production fell in 2010 (www.oica.net).

With its performance between 2008 and 2019, the Mexican automotive industry has risen to the 7th place in the world automotive industry production ranking since 2014 and has maintained its position in 2020 as well. It is in a higher rank than Turkey. It is thought that this is due to the fact that they are more successful in opening up to foreign markets. Very similar to each other, while Mexico succeeded in manufacturing its first domestic truck in 1961, Turkey succeeded in manufacturing its first domestic car in 1961. Although this similarity continued with the establishment of assembly industries in both countries, differences began to emerge in the 1990s (Dolanay & Oğuztürk, 2018; Carrillo & Contreras, 2008). Although both countries have allowed foreign multinational automotive companies to establish production facilities in their countries, allowing foreign companies to establish their country as a production base (Dolanay & Oğuztürk, 2018), while Mexico allowed foreign multinational companies to carry out their R&D activities in their country, in a sense, they allowed foreigners to form the technology path in the automotive industry, Turkey was not successful in this regard and even in 2006, Hyundai gave up on establishing a new production facility in Turkey, thus causing its failure. This unsuccessful marketing policy, in a sense, caused Turkey to return to its old political preferences and since 2011 it has returned to domestic automobile production policy. The method chosen in the first phase of this policy choice was technology transfer from multiple sources. We can say that this method, which is reminiscent of the principles used in the production of Anadolu cars, should turn into the ability to produce completely domestic cars in the next stage in the process of gaining technology development capability. We hope that this process, which took a long time and was costly in the past practices, will be shortened in the example of Turkey and lead to the formation of a new path.

However, due to the fact that not every country has the ability to develop technology in the automotive industry, we can say that both Mexico and Turkey have created their own development paths in the automotive industry and missed the chance to grow faster in the sector.

Conclusion

Mexico, when it was a colonial country in the past, gained its independence, but in the automotive industry, basically the same development path of the west was followed by western companies, and despite the experience of domestic vehicle manufacturing, only foreign and predominantly US companies thought about production and export, without the ability to develop technology. Industrial production and sales were tried to be increased. With this economic policy preference, as of 2019, it became the country with the highest production among the countries in the region and became the 7th country in the world production ranking. NAFTA is thought to have had a major impact on this result. We can say that the fact that General Motor and Ford companies have chosen the country as a production base has accelerated the development of the automotive industry.

Although Turkey got rid of being a colonial country with the War of Independence in the past, it followed the development path of the West in the automotive industry and did not consider exporting until the 1980s. However, after the 1979 economic crisis, it started to give export incentives by choosing the export-based growth model in the 1980s, and in 1994, it entered the Customs Union with the European Union and started to follow a policy of opening up to foreign markets, just like Mexico. While a very high production and sales figure were achieved in 2018 with this policy, it was observed that the figures were lower in the following years. However, since 2011, the effort to produce domestic automobiles in addition to the export-oriented production policy has reached a new stage with the production of the domestic automobile prototype in December 2018,

and we can say that a new move has been made towards gaining technology development capability in the automotive industry.

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