

A Historical Approach on the Opportunity to Acquire Technology Development Capability in Turkish Automobile Industry

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Turkey has given importance to the development of the automobile industry since the Ottoman period. While the Ottomans, who were aware of the development process of the automobile industry in the world, provided transportation by horse-drawn carriage, they thought of importing automobiles for the Sultan and high-level bureaucrats in an effort to switch to automobile transportation. However, after the proclamation of the Republic, automobile production started, just like airplanes. While a factory was established for the production of a domestic aircraft, the first automobile production facility was established in Istanbul in 1929 by the American Ford company. This factory was closed after a short time due to the world economic crisis. After the activities of the Kayseri Aircraft Factory, which lasted until 1948, came to an end, this time, Revolution car prototypes could be manufactured completely domestically in 1961. After the project, which did not go into mass production, the Koç Group started to produce the domestically-made Anadol car with technology transfer from multiple sources in 1967, but the production of Anadol continued until 1984. In 1971, Renault cars started to be produced under the French Renault license, and TOFAŞ cars under the Italian FIAT license. Towards the end of the 1970s, creative imitation applications were made in TOFAŞ cars with the bird series. In the 1990s, the production of Japanese Honda and Toyota and South Korean Hyundai cars started. In 2011, the idea of producing a domestic automobile emerged, the Devrim automobile was taken as an example in this project, the first Togg prototype was manufactured with technology transfer from multiple sources in December 2018, and it was announced that mass production would begin in March 2023. The 12-year period from 2011 to 2023 is too long for the creation of a domestic automobile. It has been understood that this long process has been passed in order to regain the pre-1980 level of technological ability. However, the most important thing is the transition from the creative imitation stage to the innovation stage. Our wish is that this process can be shortened with phase skipping approaches.

Keywords: automobile industry, technology transfer, technological ability, acquisition of technology development ability, technological development, domestic automobile

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Introduction

Today, it is generally accepted that technology is the most important factor affecting economic development. Therefore, being able to develop technology also emerges as one of the basic indicators of economic development. However, the prerequisite for developing technology seems to be having the ability to develop technology.

Technological Capability and Technology Development Capability

- Technological capability is defined as a basic concept that includes the skills and competencies of companies to make production, investment and innovation (Tiryakioglu, 2016, pp. 81-82).
- “Skill: Individual abilities required to complete a job and perform each task that needs to be done” (Tiryakioglu, 2016, p. 82).
- “Capability: The ability of an enterprise to perform a number of coordinated tasks in a conventional way, using organizational resources, in order to achieve specific results” (Tiryakioglu, 2016, p. 82).
- “Competence: The collective skills that the enterprise possesses, provided that they are above a certain threshold level” (Tiryakioglu, 2016, p. 82).

Technological capability can be seen as both a prerequisite and a result of technological development. At the macro level, technological capability brings international competitiveness, growth, and development; at the micro level, we can say that technological capability is the most important determinant of the competitive power of the company and industrial development (Tiryakioglu, 2016, p. 82).

Therefore, countries and companies that cannot develop technology resort to technology import and even technology transfer in order to make up for their deficiency (Dolanay & Oğuztürk, 2018). The purpose of technology transfer in a broad sense is that after the receiving firm or country can use and absorb the new technology, they can reproduce the technology they have acquired at a higher level. Therefore, the aim of technology transfer is to develop technology, that is, to gain the capability to develop technology that will provide it (Dolanay & Oğuztürk, 2018).

We can say that the aim of the Turkish Automobile Industry since its establishment is to acquire the ability to develop technology.

Automobile Industry Between 1923-1980

Within the framework of the principle of ensuring rapid industrialization taken at the Izmir Economic Congress, an automobile assembly facility was established by Ford Motor Company in Istanbul in 1929 with great incentives provided by the state, and the facility had both production and export targets for the domestic market. However, with this initiative, the Istanbul facility continued production for a short time, then stopped production and ended its activities. (Dolanay, 2017; Dolanay & Oğuztürk, 2018, pp. 227-251; Dolanay, 2020b, pp. 307-344; Dolanay, 2022b).

In the 1960s, while the production of different motor vehicles in the automotive industry could be realized by assembly, the automobile production facility had not been established yet. However, in 1961, Turkey’s first domestic automobile prototype could be manufactured in a short period of four months. Although the project was successful, mass production could not be started (Şimşek, 2006; Dolanay, 2017; Dolanay & Oğuztürk, 2018, pp. 251-275; Dolanay, 2020b, pp. 307-344; Dolanay, 2022b).

With the Assembly Industry Instruction published in 1963, in a sense, import substitution industrialization strategy and industry incentive policies of the development model were established. With this arrangement, the

aim was to produce similar parts of imported automotive products under local conditions. We can say that with the non-selective incentive system, the way to produce poor quality copies of foreign products has been opened (Azcanlı, 1995; Dolanay, 2017; Dolanay & Oğuztürk, 2018, pp. 251-275; Dolanay, 2020b, pp. 307-344; Dolanay, 2022b).

As of the end of 1966 and in 1967, the production of the Anadol automobile, which can be considered Turkey's second domestic automobile, started. The body of Anadol, which can be said to have been produced through the multi-technology transfer of Anadol, was composed of an unusual fiber glass material. The production of Anadol continued until the 1980s. Since the export of Anadol was not considered and production could not be started with sheet metal bodywork instead of fiberglass, production in the project could come to an end (Demirer & Aydoğan, 2008; Dolanay, 2017; Dolanay & Oğuztürk, 2018, pp. 251-275; Dolanay, 2020b, pp. 307-344; Dolanay, 2022b).

In 1971, Renault automobiles production facility in France was established by OYAK with a license agreement, and Fiat brand automobiles production facility in Italy was established by TOFAŞ (Azcanlı, 1995; Dolanay, 2017; Dolanay & Oğuztürk, 2018, pp. 276-283; Dolanay, 2020b, pp. 307-344; Dolanay, 2022b).

Automobile Industry Between 1980-2020

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, 2020a, pp. 527-554; Dolanay, 2022b).

As an industrial policy preference, the export-based growth model continued to be implemented after 1983, and accordingly, a change was made in the incentive system and export incentives came to the fore (Dolanay & Oğuztürk, 2018, pp. 284-301; Dolanay, 2020b, pp. 307-344; Dolanay, 2022b).

The Manufacturing Industry Regulation adopted in 1984, unlike the Assembly Industry Instruction, highlighted the quality development (Azcanlı, 1995). In a sense, it was determined that the automotive industry, which had developed with the technology imported from abroad until that time, should ensure technological development, and in addition, the necessity of technological development was emphasized at the national level with the first *Science and Technology Report* published in 1983 (Dolanay & Oğuztürk, 2018, pp. 284-301; Dolanay, 2020b, pp. 307-344; Dolanay, 2022b).

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, 2020a, pp. 527-554; Dolanay, 2022b).

The 1980s and especially the 1990s were the years when reports and books on science and technology increased, and institutions for technology development were established. The second *Science and Technology Report* was published in 1993 and after the establishment of TÜBİTAK (Turkish Scientific and Technical Research Council) in 1963, institutions such as TUBA (Turkish Academy of Sciences) and TTGV (Turkish Technology Development Foundation) were established in the 1990s. However, despite these efforts to create a national innovation system, the approach of ensuring development in the automotive industry by acquiring technology from abroad continued (Dolanay & Oğuztürk, 2018; Göker, 2013). The targets set in the documents on science and technology in the 1980s and especially in the 1990s could not be achieved (Göker, 2013; Dolanay, 2020a, pp. 527-554).

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 Republic¹. Thus, there has been a policy change in the Turkish automotive industry and Turkey has decided to produce its own domestic automobile. This policy change yielded its results only in December 2018, and domestic automobile prototypes were introduced by TOGG. In July 2020, the foundation of the factory was laid² (Dolanay, 2020a, pp. 527-554; Dolanay, 2022b).

After this investment opportunity missed in 2006, Tata Motor planned to invest in Turkey in 2009, but this investment did not materialize. In the 2010s, it was announced that domestic automobile production was directed, and in 2015, the domestic automobile prototype was manufactured. However, after the reactions from the public, the domestic automobile production business was tendered. Turkey's Automobile Enterprise Group, which received the tender, announced that the first prototype will be manufactured in 2020 and mass production can be started in 2022³ (Dolanay, 2020a, pp. 527-554; Dolanay, 2022b).

The prototype of TOGG could be manufactured in December 2018, the first Togg car came off the band in 2022 and it was announced that mass production would begin in March 2023⁴.

However, the domestic automobile project, which emerged as an idea in 2011, takes seven years to manufacture a prototype and 12 years for mass production, and the fact that the ongoing effort since 1923 in gaining technological skills has been accomplished in 12 years, which has not been able to do in 88 years, although it seems like a success in the Devrim car project, it took four months. While the prototype was manufactured in the Togg project, there was a seven-year process in question.

In the 10-year period mentioned above, there may have been periods of “we can't do it” and demoralization and abandonment of domestic automobile production.

In addition, we can say that in a socio-cultural structure organized according to importing technology from abroad and adapting it to itself, it is normal to encounter difficulties in adapting new technologies in periods of technological change.

General Evaluation

Table 1

*Total Automobile Production of Turkey Between 2012-2021*⁵

Years	Total automobile production
2012	577,296
2013	633,604
2014	733,439
2015	791,027
2016	950,888
2017	1,142,906
2018	1,026,461
2019	982,642
2020	855,043
2021	782,835

¹ www.hurriyet.com.tr.

² www.linkedin.com; www.odd.org.tr.

³ <https://www.togg.com.tr>; <https://www.haberturk.com>.

⁴ <https://www.togg.com.tr>.

⁵ www.oica.net.

According to David (2000; 2001; 2007), production figures in any industry should increase steadily, linearly from year to year. If this is not the case, there is a path dependency in that industry.

When we examine the production figures in the Turkish automobile industry over the 10-year period, we see that there is no steady increase. Therefore, it is possible to talk about the adherence to the path in the Turkish automobile industry. However, when we look at it historically, it is seen that the technology development stage, which is the last stage of technology transfer in the automobile industry, cannot be reached and it takes a long time to assimilate and adapt new technologies. In this case, the path implies loyalty.

It is thought that the adherence to the trail stems from a social phenomenon that took place in history. The execution of Molla Lütfi in 1495, as it was called at the time, decreased the interest in the rational sciences, encouraged transference, and thus the process of scientific knowledge, which was supposed to feed the technological developments, was interrupted. This interruption not only affected the military successes of the Ottoman Empire in the future, but also continued its effects until today (Dolanay, 2022a).

Conclusion

According to some views, it is not possible to go back from the socio-cultural environment created by a social phenomenon that occurred in the past. However, some examples of economic development in the past have shown that this reversal is possible. As a matter of fact, it is possible for Turkey to gain the ability to develop technology in the automobile industry by creating a new development path in the automobile industry and taking lessons from the past.

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