

A military aircraft, possibly a reconnaissance or surveillance plane, is shown in flight against a blue sky. Below it, a large military truck equipped with a radar system is parked on a grassy field. The entire image has a blue tint.

DISCUSSION PAPER

Turkey's National Defence Industry: Origins, Transformation, and Achievements

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Abstract

Having a competitive national defence industry (NDI) is essential for maintaining national sovereignty and interests in the modern world. There are major fundamental reasons that trigger the development of defence industries: counterterrorism, maintaining national security, and deterrence. States are often engaged in efforts to develop domestic technological systems and subsystems to gain leverage over their international rivals. Hence, Turkey has persisted in an effort to advance its defence capability with new national defence industry aspirations and projects that have high percentages of indigenously sourced weaponry and becoming less dependent upon arms imports. Turkey also seeks to become a key player in the global defence industry race. This paper discusses the chronological development of Turkey's indigenous defence industry and highlights the turning points, stimuli, and outcomes of these developments.

An Introduction to National Security

Security is pivotal for the existence, survival, and development of states in general. The definitions of 'state' or 'national security' vary, which complicates efforts to derive clear, simple, and ubiquitous definitions for these terms. As such, security is a deceptively expansive notion. Although there is no generally accepted definition, different theoretical approaches provide explanations for the idea of state security. Waltz (1979) conceptualises state security through the lens of a realist paradigm within international relations; security must be protected at all costs. According to Wolfers (1952), however, the concept of state security is fundamentally subjective, usually involving the protection of state interests and acquired values, such as economic development, stability, and border security.

In this light, it has been asserted that the enhancement of defence capabilities is the most fundamental policy for the preservation of national security. A state's defence capabilities often mean ensuring the state can protect itself from internal and external threats to safeguard its political independence and ability to make autonomous decisions involving armed forces, diplomacy, and intelligence services (Mearsheimer, 2001). Therefore, states use various methods to enhance their defence capabilities, such as technological innovation, the purchasing and transfer of technology, joint projects, and imitation (Andrea Gilli, 2019). Innovative methods are most sought after by states. An indigenous defence industry is designed to develop through innovations in military technologies. With the development and autonomy of a state's national defence industry, countries strive to reduce their dependence upon other states in order to remain secure in the international system.

(Evans, 1995). This implies that a state's defence industry is even more crucial and 'strategic' than other sectors of a state's economy or agenda.

Security concerns that involve economic factors are also key considerations that motivate states to control the financial capacity of the defence industry. States can and do aim to be more independent in their procurement of military necessities (Mearsheimer, 2001). The economic perspective is attractive to states, as it allows them to make substantial savings in the cost of defence industry products and provides the opportunity to export internationally.

While states concentrate more on the defence industry during particular periods, they also use other methods to arm themselves, such as developing defensive capabilities as a form of deterrence and avoiding the import of technologies. Great powers such as the US, Russia, and China

often make efforts to have their defence industries based upon their own resources. There are different variables for middle powers as they do not have enough technological or financial capability to improve their own NDI. These variables can include the level of technological capacity, regional or international threats, alliances, or regional and economic stability.

The main factors that trigger nations' aspirations toward autonomy in their national defence industries are terrorism, geopolitical vulnerability, and the need for economic self-sufficiency. When these challenges occur, middle powers strive more actively to develop their NDIs. The Turkish national defence industry provides a pertinent case study; it exhibits the behaviour of a middle power in response to the various challenges brought on by the changing global order of the 21st century.

Turkey's NDI Evolution

The first substantial turning point for Turkey's NDI occurred after the Cyprus Peace Operation in 1974. Turkey was subsequently subjected to an arms embargo that encouraged Turkey to establish pioneering national defence companies, such as Aselsan and Havalan. The country, therefore, began to sow the seeds of what has now become a proliferating and profitable industry in its own right (Ziylan, 2001). In the 1990s, the domesticity rate of Turkish military equipment was 20%. Today, it has reached 70% (Hürriyet, 2019). Furthermore, there have been significant advances in the NDI sector over the past decade. NDI initiatives have become more prominent, especially during the last ten years.

Beyond the embargo imposed after Turkey's intervention in Cyprus, many other factors have triggered and

driven the new initiatives; Turkey has not been able to procure some strategic weapons from its allies. For example, it was announced that the US would not sell F-35 fighter jets to Turkey, and there have been many calls by lawmakers and power centres to remove Turkey from the F-35 programme. Reports also indicate that France is currently blocking Turkey from the SAMP-T process (Defenseworld, 2020).

Turkey has reached another turning point in the evolution of the national defence industry at a time when it has encountered recent regional terror threats and instability (Erboğa, 2017). Finally, it can be added that the increasing trend of indigenisation in the global economic race for defence acquisitions has also stimulated the Turkish NDI to compete internationally.

The Transformation of the Turkish Defence Industry

The development of Turkey's national defence industry has been one of the most significant ways for the country to sustain its national sovereignty, security, and stability. The following analysis of the transforma-

tion of the Turkish defence industry sheds light on the changes and turning points in Turkey's defence policies over time.

The Early Republican Period

Progress in the defence industry during the early Republic Period was at the top of the national priority list, in line with the principle of *etatism*, a doctrine which emphasises a state's strong and inclusive economic and social policies. The newly founded republic aimed to apply an immediate and comprehensive development strategy. Mustafa Kemal Atatürk, the founder of the Turkish Republic, stressed the significance of improving the national defence industry at the Izmir Economic Congress on 17 February 1923. Soon after the congress, he established a small arms ammunition plant in Kırıkkale. In a similar vein, factories producing military materials were rapidly established in various areas within a few years, such as the Eskişehir Air Repair Shop and the Şakir Zümre Factory (Seren, 2018). During the Turkish War of Independence, be-

tween 1919 and 1923, new facilities for land weapons production were established near Ankara. These early developments were not enough for Mustafa Kemal Atatürk, however, who had a much larger vision for the future of Turkey's defence industry. As a pioneer in the Turkish aviation industry, Tayyare and Motor Türk A.Ş. was established with a German partner, Junkers Flugzeugwerke AG, in 1926. After the German partner left the partnership in 1928, the company continued to manufacture under the name "Kayseri Tayyare Fabrikası" from 1931 until the late 1940s. The company's factories manufactured more than a hundred aircraft (TRT Haber, 2018). Nuri Kılıçgil was the first private firm which served the Turkish defence industry in the production of arms and equipment from the late 1930s to the mid-1940s.

The Cold War Period

After World War II, Turkey became an ally of the US against the rising threat of the USSR, resulting in Turkey's membership in the North Atlantic Treaty Organization (NATO) in 1952. This alliance significantly shaped the development and structure of the Turkish defence industry. The Marshall Plan also provided essential financial support to Turkey (Nurgün Koç, 2017). The United States saw that Turkey was at the forefront in the prevention of Soviet expansionism, and the US

and Turkey signed agreements to modernise the Turkish army (Real- Pinto, 2017). NATO then became the most significant security guarantor against any Soviet threat to Turkey. Turkey supported and cooperated with NATO to the maximum extent possible (Oğuzlu, 2013).

Turkey imported military equipment of various types from the US, including M-47/48 tanks and F-4E (Phantom II) fighter aircraft. However, that resulted in too

much dependency on NATO weapons and systems. No adequate indigenous Turkish defence industry existed at that time. Therefore, when the Turkish military operation in Cyprus was needed during the Cyprus Events of 1963-64, Turkey was limited in its ability to engage in military operations without support from NATO. However, Turkish forces carried out an operation dubbed the 'Cyprus Peace Operation' in 1974 despite opposition from the US. This resulted initially in a tacit arms embargo on Turkey, which was then officially implemented by the US in the same year (States, 1982). During this period, the Turkish leaders realised the importance of avoiding dependency on foreign countries, NATO allies included.

One of the most important companies of the Turkish defence industry today was established during that time. Otokar was founded in 1963 for the production of land forces equipment, such as tanks and armoured cars. Aselsan was established in 1976 for the production of land forces' equipment and electronics (Real-Pinto, 2017). In the 1980s, Turgut Ozal, a former Turkish Prime Minister and President, initiated the aspiration for today's principles of production as 'domestication', including national companies like Turkish Aerospace Industries (TAI) and Roketsan, which was founded in the late 1980s (TUSAS, 2019).

Post-Cold War

In the 1990s, due to the internally complicated and dynamic political agenda of the country, the Turkish defence industry struggled to make new major investments. Nevertheless, efforts were made to adopt Ozal's vision and increase domestic production in the defence industry. Defence Technology, Engineering and Trade Inc. (STM) was founded in 1991 under restricted financial circumstances (Defence Technology, 2019).

In the 2000s, after the Justice and Development Party (AK Party) came to power, the government was de-

termined to further increase the country's indigenous defence capacity in order to eliminate dependency on imports of strategic military equipment. Indeed, the implementation of long-term projects designed to increase domestic capability was essential to the development of a military capability which would rely upon national domestic weaponry from original Turkish designs and cutting-edge technologies. These projects would begin to produce their first tangible results in the 2010s.

Turkey's Rationale for Creating a National Defence Industry

NATO, which is Turkey's key alliance in the fields of defence and security, has been reluctant to prioritise Turkey's security priorities. These security priorities include counterterrorism, border security, and regional threats. This situation has also contributed to the indigenisation of Turkey's NDI. Another security

reason that has instigated the NDI has been the threat posed by terrorist organisations, including the PKK and Daesh. Moreover, the rising regional instability following the Arab Spring has led to further justification for the development of more autonomous capabilities in the defence industry.

Economic factors have likewise stimulated nationalisation in the Turkish defence industry. The rise of nationalism and protectionism among states that contribute to the international defence economy has encouraged Turkey to increase its domestic production. Expansion of Turkey's NDI, first of all, contributes to the Turkish economy because the number of imported products is reduced and jobs are created. Secondly,

the production of high-tech products creates opportunities to enter and compete in foreign markets. Thirdly, the indigenisation of military technology assists in the technological development of other sectors. Within this framework, a key aspiration for Turkey's domestic defence industry can be seen as financial, with tangible outcomes particularly in the last ten-year period.

Security Reasons

NATO's Reluctance to Supply Turkey with Arms

Since 1952, Turkey has determined its security paradigm through NATO. After the NATO decision to impose the US embargo on Turkey in the aftermath of the Cyprus operation, it became clear that a domestic defence industry would be the only guarantee for Turkey to secure armaments. Nationalisation initiatives also created barriers to arms procurement. For example, several problems impeded Turkey's desire to purchase German Leopard tanks, confirming the necessity to manufacture indigenous tanks. Developments in recent years, such as Turkey's production of unmanned aerial vehicles (UAVs), are a direct

consequence of issues in supply. Turkey also suffered from many technical problems with unmanned aerial vehicles that were procured from Israel (Heron UAV) due to engine breakdowns and intelligence errors. In addition, Turkey's demands for these vehicles often remained unanswered by its NATO allies. For example, air defence systems like the Patriot and armed unmanned aerial vehicles have not been provided to Turkey (Gilsinan, 2019). The unwillingness of NATO members to supply arms systems has positively affected the development of the Turkish defence industry, pushing Turkey to find domestic solutions.

The PKK and Regional Instability

In the context of fighting against terrorism, Turkey has not received either political or military support from many of its allies. The PKK, which is recognised as a terrorist group by many countries and international organisations, including Turkey, the US, the EU and NATO, is the main terrorist group threatening Turkey's security. In Turkey's conflict with the PKK, more than 40,000 lives have been lost since the 1980s (Marcus, 2007).

The PKK's irregular military action has created many needs for weapons technology. The most critical initiatives in the domestic defence industry to fight against the PKK are unmanned aerial vehicles, ATAK helicop-

ters, and Firtina howitzers. Armed and unarmed unmanned aerial vehicles have enabled Turkish forces to locate PKK members without utilising manpower. As a result, there has increasingly been more production of these resources in the Turkish domestic defence industry. In line with these developments, Turkey has gained greater autonomy in its counterterrorism efforts (Yenisafak, 2018). In particular, the lack of high-tech and high-operative destruction weapons during the 1990s led to many Turkish deaths. In the struggle against the PKK, domestic weapons have been used and have shown positive results, with fewer casualties inflicted by the PKK and increased destruction of the terrorist group's assets (Kasapoğlu & Kırdemir, 2018).

During Operation Euphrates Shield in 2016, Turkey launched a military campaign against Daesh. In this operation, domestically produced military weapons and vehicles were used, including the Bayraktar TB2 unmanned aerial vehicle, Firtina howitzers, local MPT76 military rifles, Cirit missiles, and Kirpi mine-resistant ambush-protected vehicles. These products were also used in the Olive Branch and Peace Spring operations.

As the Middle East witnessed a period of unrest following the Arab Spring revolts, especially in Syria, security threats for Turkey increased. In this context, several issues were raised, including the proposed purchase of S-400 and Patriot missiles. As an upshot of these developments, Turkey has tried to ensure its security by turning to domestic production.

The 'Turkification' of the Industry

During the last decade, new aspirations arose in the Turkish defence industry, and 'Turkification of the Industry' became a central theme. The government mandated important projects in the context of 'domestic production,' 'being national,' and 'strategic autonomy' by working with leading companies in the defence industry, including Aselsan, TAI, and Roketsan (Seren, 2018). According to the latest reports, leading

Turkish companies in the defence industry are among the world's top 100 in revenue: Aselsan, \$1.8 billion; TAI, \$1.05 billion; STM, \$564.8 million; and Roketsan, \$522.8 million. In 2018, these companies had improved their ranking from the previous year in the most reputable list for the defence industry, Defence News Top 100 (Ergocun, 2019).

The Impact of the NDI on the Turkish Economy

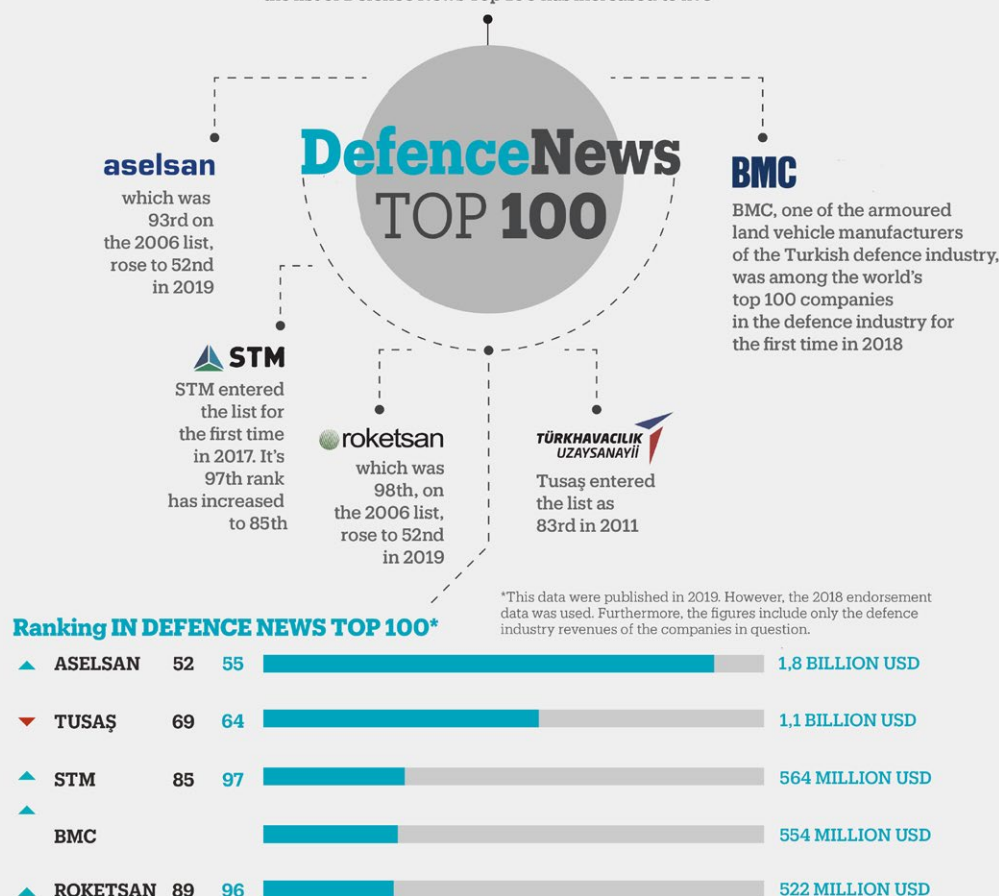
Another positive aspect of increased domestic production of weapon technologies is its economic contribution. As Turkey has invested more in the defence industry, the latter made roughly \$2 billion in exports according to the latest figures (Agency, 2019). Although this figure is approximately only 1-2% of Turkey's overall exports, the defence sector has great long-term export potential moving forward.

Technological developments in the defence industry have also positively affected other high-tech sectors. For example, the development of software for helicopters and tanks also contrib-

utes to software technology for other non-military products. Furthermore, advances in the insulation technology, mechanical technology, and motor technology of military weapons also contribute to the production of items used in everyday life. Advances in NDI production contribute to the economy in general, as well as to software technology, engine technology, and artificial intelligence. Local employment opportunities have also increased. Although security is the main reason to develop the indigenous national defence industry, economic reasons also play a role in making this industry sustainable.

Turkish Defence Companies, World Ranking

The number of Turkish Defence Sector companies in the list of Defence News Top 100 has increased to five



Prominent Turkish Weapons Technologies

Drones

In recent years, developments in the Turkish aerospace industry have been at the forefront of Turkey's national technological and political-military autonomy. The AnkaUAV, which is in the advanced medium-altitude long-endurance (MALE) class of unmanned aerial systems, is manufactured by TAI, the

Turkish Aerospace Industries. It is the first Turkish indigenous drone, and has the following attributes: *...[it] performs day and night, all-weather reconnaissance, surveillance, target detection/identification and intelligence missions with its EO/IR and SAR payloads, featuring the autonomous flight capability including*

Automatic Take-off and Landing' (Sanayi, 2019). In addition to the national enterprises, private companies, including Baykar and Vestel, have developed aerospace capabilities, especially with respect to UAVs. Baykar's Bayraktar TB2 tactical UAV system has been developed for 'tactical reconnaissance and sur-

veillance missions' (Turkey, 2019). The TB2 and Anka have been upgraded to armed tactical UAVs and have been used effectively during Turkey's Operation Olive Branch, Operation Euphrates Shield, and Operation Spring Shield.

Aircraft

In addition to drones, there has been tangible success in the strategic cooperation with foreign firms for the development of projects, such as the Hürkuş series, including the Hürjet trainer aircraft and the T129 Atak multirole attack helicopter. The T129 Atak is produced by TAI in partnership with Augusta-Westland, an Anglo-Italian company. The helicopter is equipped with indigenous military equipment, the RoketsanCirit missile system, which 'incorporates asymmetric weapon loading capability and enables the use of all weapons effectively according to mission requirements (TAI, 2019). T129 Atak helicopters have been used on the ground by the Turkish army since late 2014. Turkey has also sold 30 of these helicopters to Pakistan for \$1.5 billion; this was the largest single export from the Turkish defence industry in history. As an upgrade to the T129 Atak, the Heavy-Duty attack helicopter project has been scheduled for completion within the next five years.

Turkey has been strategically supporting the production of the F-35 programme with indigenous military products from Aselsan and TAI within an international consortium of several countries, including Australia, Canada, the United Kingdom, and the United States. However, issues related to the F-35 programme have brought changes to Turkey's current agenda. In the long run, Turkey aims to substitute its current F-16 fighter aircraft with a completely domestic product, the TF-X. Turkey has introduced the TF-X as an indigenous design in the context of a development program to replace the active F-16/F4 fleet. If the project is implemented as planned, the Turkish air force will have the necessary technology infrastructure, engineering, and production capabilities to produce a fifth-generation jet fighter (Turkey, 2019).

Land and Sea Armaments

Even if the number of indigenous products related to airpower increases significantly, the Turkish defence industry's most important aspirations lay in land and naval forces. Major projects have been planned and completed by the Turkish defence companies listed above. The Turkish army has added new technologies and has also replaced ageing stocks of Cold War-era arms equipment throughout the country (Stratfor, 2019).

Flagship projects include the Altay main battle tank from Otokar; a Turkish national warship from Milgem;

Koral, an electronic warfare (jammer) system by Aselsan; and the T-122 Sakarya domestic multiple rocket launcher from Roketsan. Moreover, Turkish defence companies have been involved in many programs, from the production of a single national rifle, such as the MPT-76, to the development of a national missile system, such as the Bora (CS Savunma, 2019). Instead of importing subsystems, Turkish authorities have increasingly invested in the Turkish defence industry. A high level of independent military capacity will strengthen Turkey's military power and protect its regional interests.

The Usage of Turkey's Indigenous Weapons in Idlib (Operation Spring Shield)

Operation Spring Shield was launched in Idlib after 38 Turkish soldiers were killed by an airstrike purportedly carried out by the Assad regime. It has become an illustration of the effectiveness of the Turkish defence industry and the development of new methods of military operation by the Turkish armed forces. Despite the closure of Syrian airspace, Turkish Anka drones and TB-2 UAVs successfully penetrated Syria's airspace and completed many effectual airstrikes. Organised airstrikes took place, which utilised a vast number of UAVs. As a result, many pundits have claimed that the use of drones was a game-changer during this operation (Aljazeera, 2020).

A wide range of Turkish indigenous weapons and systems were used in Operation Spring Shield. Oth-

er domestic systems, like Koral, Aselsan's electronic warfare (jammer) system, supported Turkish airstrikes against Syrian forces in sophisticated coordination with Turkish aerospace systems (Al-Monitor, 2020). Consequently, the Turkish Defence Ministry announced that its forces had neutralised 151 tanks, 47 howitzers, 3 airplanes, 8 helicopters, 3 drones, and 8 defence systems. They had also eliminated a reported 3,000 Syrian regime troops. As a result, Turkish military forces were successful in their military operation with the support of its indigenous defence industry (Anadolu Agency, 2020). The operation also proved that Turkish military forces could carry out sophisticated military operations without depending upon weapon systems from other countries.

Conclusion

The increasing figures in Turkish indigenous production and investment are important signs of a promising future for Turkey's defence industry. Some analysts have alleged that these numbers are 'somewhat misleading'; their main premise is that Turkey's indigenous programs, in the defence sector in particular, are heavily linked to foreign partnerships and imported subsystems. However, there have been tangible strides in the national defence industry, the outcome of sustained efforts to increase demand for exports and reduce dependency upon arms imports. The numbers prove that the Turkish Republic has now become almost independent of weapons imports.

The Turkish armed forces, the second-largest military force in NATO, have efficiently used indigenous defence systems against terrorist organisations, such as the PKK and Daesh. They have gradually begun to reach a high level of technological infrastructure to

build upon, stimulated by public and private enterprises in a worldwide race to modernise the defence industry. As they have already established themselves in the field, it seems evident that the Turkish national defence industry will continue to progress.

Overall, a wide range of domestically produced high-tech Turkish weapons have been successfully used in Operation Euphrates Shield, Operation Olive Branch, and Operation Spring Shield. This success in cross-border security operations has demonstrated Turkey's progress in the arms industry, motivating state and private enterprises to invest more in the indigenous defence industry. In addition, some international disputes, such as the F-35 issue, have stimulated the country – located as it is in a conflict-prone geopolitical position – to further enhance its self-sufficiency in the defence industry. Investment in the defence industry is, therefore, not an option for Turkey; it is sensible statecraft.

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