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Exploring the Progress in Türkiye's Defense Industry: Reflections in Geopolitics, Counter-Terrorism and Economy

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Over the years, Türkiye's military technology has advanced significantly. With an emphasis on reducing reliance on foreign sources and boosting domestic production, the nation's defense sector has achieved a notable degree of independence. These advancements have transformed the Turkish Armed Forces from a conventional land force into a modern military equipped with advanced infantry systems and unmanned aerial vehicles, which has notably strengthened its counter-terrorism capabilities. Today, Türkiye is recognized as a prominent manufacturer and exporter of military hardware, reinforcing not only its defense capacity but also its geopolitical influence and economic standing. A strong national defense industry has played a key role in advancing Ankara's strategic objectives on the international stage. The purpose of this study is to explore the evolution of Türkiye's defense industry and its contribution to national security, geopolitical standing, and economic growth. Utilizing a qualitative and descriptive method, the paper examines past trends, technology, and export levels based on official documents and academic literature. Findings indicate that Türkiye's defense advancements have strengthened its autonomy in military operations, enhanced its international standing, and contributed positively to economic indicators through increased exports and employment.

KEYWORDS: defense industry, Türkiye, military technology, geopolitics, economics, counter-terror

A török védelmi ipar fejlődésének feltárása: terrorizmus elleni küzdelem és gazdaság: geopolitikai, terrorizmusellenes és gazdasági megfontolások

Az évek során Törökország haditechnikája jelentősen fejlődött. A külföldi forrásoktól való függőség csökkentésére és a hazai termelés fokozására helyezett hangsúlyt, a nemzet védelmi ágazata figyelemre méltó függetlenséget ért el. Ezek a fejlesztések a török fegyveres erőket hagyományos szárazföldi haderőből fejlett gyalogsági rendszerekkel és pilóta nélküli légi járművekkel felszerelt modern hadsereggé alakították át, ami jelentősen megerősítette a terrorizmus elleni képességeit. Ma Törökországot a katonai hardverek kiemelkedő gyártójaként és exportőreként ismerik el, ami nemcsak védelmi kapacitását, hanem geopolitikai befolyását és gazdasági helyzetét is erősíti. Az erős nemzeti védelmi ipar kulcsszerepet játszott Ankara stratégiai célkitűzéseinek előmozdításában a nemzetközi szinten. E tanulmány célja, hogy feltárja a török védelmi ipar fejlődését és hozzájárulását a nemzetbiztonsághoz, a geopolitikai pozícióhoz és a gazdasági növekedéshez. A tanulmány kvalitatív és leíró módszert alkalmazva hivatalos dokumentumok és tudományos szakirodalom alapján vizsgálja a múltbeli trendeket, a technológiát és az export szintjét. A megállapítások azt mutatják, hogy Törökország védelmi fejlesztései megerősítették autonómiáját a katonai műveletekben, növelték nemzetközi tekintélyét, és a megnövekedett export és foglalkoztatás révén pozitívan járultak hozzá a gazdasági mutatókhoz.

KULCSSZAVAK: védelmi ipar, Törökország, katonai technológia, geopolitika, gazdaság, terrorizmus elleni küzdelem

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Historical Development of the Turkish Defense Industry

Early developments in the Türkiye defense industry date back to the first years of the Republic of Türkiye. Türkiye was established in 1923, under the leadership of Mustafa Kemal Atatürk, as an insurgency against imperialism with the very own support of the Anatolian people. Kuvay-i Milliye, an armed formation that Anatolian people set up under Atatürk's leadership, gained heroic victories against the invaders of Anatolia, defeating and driving them off the borders of the Kuvay-i Milliye.

The victory was achieved under the most austere conditions, having no significant arms and wares, however, those on the other side of the battlefield had the most technological arms and vehicles.¹ Victorious from the war, Türkiye took essential lessons for developing its very own independent defense industry and headed its face to produce its own arms, ammunition and military vehicles along with building its own economy. However, technology developed in this term was mainly a product of technology transfer from European countries.

Firstly, technology transfer played a vital role, and then it turned into indigenous research and development efforts. These efforts were mainly public-private partnerships, government investments, and a few private investments such as Nuri Demirağ and Vecihi Hürkuş.

According to 22 public and private enterprises were established between 1923 and 1950.

Those were;

Table 1.
Public and Private Enterprises Between 1923–1950

<i>Factory Name</i>	<i>Year Established</i>
Ankara Weapon Factory	1923
Ankara Carpenter Factory	1924
Şakir Zümre Aircraft Bomb and Weapon Factory	1925
Kırıkkale Artillery Ammunition Factory	1925
Kayseri Aircraft Factory / TOMTAŞ	1926
Eskişehir Aircraft Repair Factory	1926
Ankara (Gazi) Cartridge Factory	1927
Brass Casting and Rolling Mill	1928
Nuri Killigil Weapon Factories	1930
Kayaş Capsule and Primer Factory	1931
Kırıkkale Steel Casting and Rolling Mill	1931
Silahtarağa Cartridge Factory	1932
Kırıkkale Rifle Factory	1935
Elmadağ Gunpowder Factory	1935
Beşiktaş Nuri Demirağ Aircraft Factory	1936
Kırıkkale Nitrocellulose Gunpowder Factory	1936
Kırıkkale Gear Factory	1937

¹ Erhan 2022, 143–145. Detail.

<i>Factory Name</i>	<i>Year Established</i>
Erzurum Weapon Factory	1939
THK Etimesgut Aircraft Factory	1941
Mamak Gas Mask Factory	1942
THK Gazi Aircraft Engine Factory	1945
Machine and Chemical Industry (MKE) Corporation	1950

The MKE Kırıkkale tanks, which were basically Soviet T-37 amphibious light tanks, were the first tanks utilized by the Turkish army. One such tank, made by the state-owned MKE (Makine Kimya Endüstrisi: Machine and Chemicals Industry), was given to Türkiye by the USSR in 1935.²

Regarding civil aviation initiatives, Vecihi Hürkuş developed his own workshop in 1931 and produced an aerial vehicle named the "Vecihi-XIV." TOMTAŞ (1926) and Nuri Demirağ (1936) initiated the first and largest private sector project in defense aviation in Türkiye by constructing an aircraft factory that produced 24 trainer aircraft and six-seat passenger aircraft.³

These developments were a huge success for the newly established Republic of Türkiye; however, they did not last long. Those factories were closed as they remained inefficient in lieu of developing technology. Türkiye were given arms and aid with the Truman Doctrine and Marshall Plan by its NATO allies in the coming years; however, those enterprises formed a solid foundation for Türkiye's defense industry.

Those plans were aimed at Türkiye and Greece to keep away from the Soviet threat; however, the given aid turned into dependence on US arms, triggering further purchases and more integration with Western military technology. During the Cold War, Türkiye received consistent aid from the US, while the development of its own defense industry slowed down.

The need for an indigenous defense industry utterly hit the face of Türkiye when the Cyprus problem erupted in the 1960s.⁴ Once Türkiye wanted to stop the incidents, the Johnson Letter Incident hit the agenda sharply. President Johnson urged Türkiye, with extremely threatening language, not to launch an operation to the island by using the US arms and not support Türkiye if the Soviets were involved in the conflict.

Despite threats, Türkiye negotiated with the UK and the US and informed its right to intervene as a Guarantor State under the 1960 Agreement.⁵

Türkiye wanted to stop the conflict in the 1960s, but a letter received from US President Johnson in 1964 informed Turkey that the US would not support Türkiye if the operation caused any infringement with the Soviets. Besides, there was a threat from President Johnson to Türkiye not to use any of its arms in any operation to Cyprus. As Türkiye had no landing crafts made by anyone other than the US, *"...since the 1960s, the Turkish navy has tried to produce ships in its shipyards to the extent of its possibilities and capabilities in order to*

² Atik 2023.

³ Erhan 2022, 144.

⁴ Oran 2001.

⁵ Republic of Türkiye Ministry of Foreign Affairs. n.d.

*renew and improve the ships in its fleet...*⁶ In this context, Türkiye concentrated on building national landing warships and arms until the Cyprus Peace Operation.

Finally, in 1974, Türkiye launched a Cyprus Peace Operation in order to save the lives of Turkish Cypriots and bring peace to the island.⁷ Türkiye achieved its aim to stop the incidents between Greek and Turkish Cypriots on the island, however, it had some results for Türkiye. The US canceled its military aid program with Türkiye and applied an arms sales embargo on Türkiye, which would last till 1978.

The embargo, however, impacted the Turkish defense industry positively, by waking the production back. The Turkish Naval Support Foundation, which campaigned for constructing indigenous landing ships which were needed for the Cyprus Peace Operation, grew and turned into the Turkish Armed Forces Foundation (TSKGV).⁸ TSKGV developed and launched affiliates such as HAVELSAN, ROKETSAN, and TAI.

In the 1980s, the embargo left its place to cooperation between the US and Türkiye. Turkish Aerospace was founded in Akıncı, Ankara, as a Turkish-American joint investment corporation to produce manned and unmanned aerial vehicles, which was a base for today's high technology Turkish unmanned vehicles.

To strengthen the Turkish Air Force's fleets, this factory designed and developed fourth-generation combat aircraft and F-16 aircraft. Throughout the project's four phases, 308 F-16s were built, 46 of which were produced by the United States for the Egyptian Air Force.

Beginning in the 1990s, Türkiye was attacked by the PKK terror organization and lasted till nowadays. Excusing so-called '*human rights violations*', Western countries imposed an embargo on Türkiye for sales of arms. The embargo impacted the development of the domestic defense industry in a way similar to the embargos applied by the US following the Cyprus Peace Operation. It fueled the production of armored personnel carriers, TAI TF-X (Turkish Fighter X), TAI Anka UAV, TAI Aksungur UAV, HÜRKUŞ, basic and primary trainer aircraft, HÜRJET light attack aircraft, TAI T625 Gökbey transport/utility helicopter, TAI/AgustaWestland T129 ATAK multi-role, all-weather attack helicopter, T-70 multirole utility helicopter, and Göktürk 1-2-3 Satellites.⁹

Entering the 2000s, "...*Türkiye had looked to the Israelis for drones. Indeed, Türkiye was Israel's primary customer in the purchase of the Heron UAV, which proved a critical system for collecting national security intelligence.*"¹⁰ Preventions from the US and Israel to sell any drones to Türkiye actually impacted a positive return as Türkiye launched its program to produce nationally owned drone.¹¹

Private defense companies in Türkiye come to the forefront such as Baykar Machine. Baykar is known for its high technology unmanned air vehicles. Most known ones included

⁶ Sertel 2022, 254.

⁷ Oran 2001.

⁸ Türkiye Cumhuriyeti Millî Savunma Bakanlığı Genel Kurmay Başkanlığı- Türk Silahlı Kuvvetleri, n.d.

⁹ Erhan 2022, 143.

¹⁰ Rossiter and Cannon 2022, 212.

¹¹ Kudar 2021, 160–165.

the Bayraktar Mini Unmanned Aerial Vehicle (UAV), the Malazgirt rotary-wing mini-UAV, Tactical UAV, Bayraktar TB2, and Bayraktar Akıncı (UCAV).

On the other hand, one of the most critical projects that Türkiye was involved in was fifth-generation firefighters with a coalition of Western countries led by the US. Türkiye efforted many years in this project, however, “...the NATO failure to defend Turkish airspace from missiles as a result of conflicts in Iraq and especially Syria which resulted in high numbers of civilian casualties in the border cities as a result of ISIS and YPG (Syria branch of PKK) attacks lead Türkiye to seek other sources.”¹² Türkiye had purchased S-400 Missiles from Russia, and as a result of this, the US excluded Türkiye from the project.

Not only did Türkiye improve its technology in air and land forces, but also in naval forces. National ship projects called MILGEM warships, an intelligence warship called TCG Ufuk, and an amphibious assault warship called Anadolu were built and joined the inventory of Turkish Naval Forces.

In nearly all of those improvements in domestic defense industry development, the US embargo on Türkiye played a vital role and triggered the National Technology Initiative. In this context, organizations such as TAI, TEI, ASELSAN, HAVELSAN, and ROKETSAN played pivotal roles in developing and modernizing the Turkish Armed Forces.

Improvements in the national defense industry not only empowered the Turkish Armed Forces but also reinforced Türkiye in terms of politics, economy, and geopolitics. “The defense industry has three roles in every state, namely, military, political, and economic ones.”¹³ In international relations, Türkiye gained more respect. Its technology has come to the forefront in the world arena over the last 10 years.

Key Advancements in the Turkish Defense Industry

Since the start of the Turkish National Technology Initiative, Türkiye has produced many vehicles, arms, and weaponry systems. Some of those replaced the imported arms and vehicles from abroad, while others took their place in the Turkish Armed Forces’ inventory for the first time. This new technology shines out with its cutting-edge features which competes with equivalent ones owned by world super powers. Some of those which come to the forefront with the most technological features are as follows:

TAI TF-X (Turkish Fighter X) – KAAN

The design and creation of KAAN rose with Türkiye’s exclusion from the F35 project as Türkiye purchased S-400s.¹⁴ In a contentious decision, Ankara decided to purchase Russia’s S-400 air defense system, with delivery scheduled to begin in 2019, however, the US government responded by pulling Türkiye from the F-35 Lightning II program causing a rise

¹² ATİK 2023.

¹³ Málnássy 2022, 62.

¹⁴ Özgen 2022.

in tensions with Washington over Sweden's NATO membership and other matters have impeded efforts to modernize and grow the sizable F-16 fleet.¹⁵

The project aims to close the gap in the air-air warfare needs of Turkish Air Forces. As a 5th-generation fighter, Türkiye plans to replace F-16s with KAAN towards the end of the 2020s.

The ‘Heads of Agreement’ (HoA) for the development of KAAN between TAI and BAE Systems (UK) was signed on January 28, 2017, while the agreement protocol was signed on May 10, 2017. The collaboration agreement between TAI and BAE Systems entered into force on August 25, 2017, after being signed.

With capabilities such as low observability, internal weapon bays, high maneuverability, enhanced situational awareness, and sensor fusion that are required in a next-generation aircraft, Türkiye will position itself among a limited number of countries with the infrastructure and technology to produce a 5th generation combat aircraft alongside the United States, Russia, China, and others.¹⁶

On February 21, 2024, at 08:50, it completed its first flight, remaining airborne for 13 minutes. During this flight, it reached an altitude of 8000 feet and a speed of 230 knots.

KAAN ensures superior air dominance with:

- Extended Air-to-Air Combat Range with New Weapons;
- Precision and Full Strikes from Internal Weapon Bays at High/Supersonic Speeds;
- Enhanced Combat Power with Artificial Intelligence and Neural Network Support.

TAI Anka UAV

The Turkish Unmanned Aerial Vehicle “ANKA,” designed by Turkish Aerospace Industries engineers, completed its assembly and production and emerged from the hangar on July 16, 2010. With a high readiness rate for missions, ANKA fleets have been integrated into the inventories of various end-users and have accumulated over 230,000 flight hours as of January 2024.

T129 ATAK Multirole Combat Helicopter

The T129 ATAK Helicopter has been developed using Türkiye’s indigenous capabilities to meet the Turkish Armed Forces’ attack helicopter needs under the TAI’s responsibility for development, system integration, testing and verification, serial production, and lifetime logistics support.

The performance of the T129 ATAK Helicopter has been optimized for challenging “hot-high” altitude missions, effectively operating in both night and day conditions with high maneuverability and performance capabilities in the Turkish Armed Forces’ operations.¹⁷

The T129 ATAK Helicopter flew firstly in 2011, joined the Turkish army inventory in 2014. It has cross-edging features such as:

¹⁵ Military Science 2024.

¹⁶ TürkHavacılık UzaySanayii n. d.

¹⁷ Türkiye Yüzyılı n. d.

- 76 x 70 mm (2.75”) Klasik Roket;
- 16 x 70mm (2.75”) CİRİT® GÜDÜMLÜ ATGM;
- 20 mm Top (500 Top mermisi);
- 8 x STINGER® Havadan-Havaya Füze;
- 8 x UMTAS® Tanksavar Füze (TAI, n.d.).

The Turkish Land Forces will get 91 (59 + 32 optional) T129 ATAK helicopters as part of the Turkish ATAK Program, while the Ministry of Interior will receive 27 (24 + 3) optional T129 ATAK helicopters. To date, more than fifty ATAK have been shipped.

T129 ATAK was also ordered by Pakistan (30 units) and the Philippines (8–10 units).¹⁸

Bayraktar TB2 Tactical UAV System

The Bayraktar TB2 Tactical UAV System was designed and put into service by Baykar. It is an all solution in one place system. The system is made up of modules such as the Generator with a Trailer, Ground Control Station, Ground Data Terminal, Remote Image Terminal, Advanced Base, and Bayraktar TB2 UAV Platform. Baykar's technological progress allowed the entire system to be produced both nationally and domestically.¹⁹

Table 2.
Technical Specifications of Bayraktar TB2 Tactical UAV System

Specification	Detail
Communication Range	<300 km
Cruising – Max Speed	70 knots–120 knots
Payload Capacity	150 kg
Payload - ISR	Interchangeable EO/IR/LD or Multi-purpose AESA Radar
Payload – Munitions	4 Laser-Guided Smart Munitions
Fuel Capacity/Type	300 Liters / Gasoline
Takeoff and Landing	Runway (Automatic)
Maximum Takeoff Weight	700 kg
Endurance	27 Hours
Wingspan	12 meters
Height	2.2 meters
Length	6.5 meters
Propulsion Type	105 HP Internal Combustion Injection Engine
Operational Altitude	18,000–25,000 feet

Bayraktar Akinci UAV

The strategic Bayraktar Akinci platform has a unique fuselage and wing design that allows it to carry a variety of payloads. The dual artificial intelligence avionics on board the Bayraktar AKINCI provide real-time signal processing, sensor fusion, and situational awareness.

¹⁸ Turkish defense news 2020.

¹⁹ Baykartech n. d.

Bayraktar AKINCI has the ability to carry out fighter jet operations. Air-to-air radar, collision avoidance radar, synthetic aperture radar, dual satellite communication systems, and electronic support systems are all aboard. Both air-to-air and air-to-ground attack operations can utilize Bayraktar AKINCI. With its triple redundant electronics hardware and software systems Bayraktar AKINCI is capable of carrying the following payloads:

Table 3.
Payload Options of Bayraktar AKINCI UAV

Payload Type	Name
Mini Smart Munition	MAM-L, MAM-C, Bozok
Missile	Cirit Missile
Anti-Tank Missile	L-UMTAS Missile
Guided Bombs (JDAM)	MK-81, MK-82, MK-83
Wing Assisted Guided Bomb	MK-82(Wing Assisted)
Air to air Missiles	Gökdoğan, Bozdoğan
Stand off Missile	SOM-A

Bayraktar AKINCI will be equipped with a multifunction AESA Radar system for air-to-air, synthetic, and meteorology estimation.²⁰

Table 4.
Technical Specifications of Bayraktar AKINCI UAV

Specification	Detail
Communication Range	LOS & BLOS
Payload Capacity	1,500 kg
Payload – ISR	Simultaneous EO/IR/LD, Multi-Purpose AESA Radar
Payload – Munitions	Laser Guided Smart Munitions, Missiles & Long-Range Munitions
Take off and Landing	Runway (Automatic)
Maximum Takeoff Weight	6,000 kg
Endurance	24 hours
Wingspan	20 meters
Height	4.1 meters
Length	12.2 meters
Maximum Speed	150–195 knots
Operational Altitude	30,000–40,000 feet
Maximum Altitude	45,118 feet
Thrust Type	2x850/2x750/2x450 HP Turboprop Engines

Most of the arms and vehicles produced by the Turkish Defense Industry have competitive features, and they are as strong as their developed countries' equivalents. Plus, Turkey has no bureaucratic process for approval the export sales, puts no conditions on the use of the arms, and has comparatively affordable maintenance costs.²¹ Notwithstanding those advantages, Ukraine chose to go with Turkish UAVs during its war with Russia.

²⁰ Baykartech 2025.

²¹ Esen 2023.

Impacts on Geopolitics

Türkiye is located at the crossing point of Asia, Middle East and Europe. Having located such a strategically significant point makes Türkiye to follow proactive policies regionally and globally. Shaped by a realist perspective, Türkiye's security policies are challenged by the threats which led Türkiye to use force against them.

Türkiye, in its region, fights with the PKK in Northern Iraq and Northern Syria, has conflicting interests in Ukraine, Syria, Eastern Mediterranean, Azerbaijan, and finally in Libya. The solution of those conflicts was not only managed via military measures but also political efforts. In doing so, one important instrument to follow effective foreign policy is to have a national and deterrent defense industry.

Similar to the state's role in international politics, the defense industry has the same main focus. In doing so, in addition to being financially advantageous for a state, arms exports can be utilized to influence political outcomes. Where states are individual independent entities, they make politics and seek ways to maximize their interests. One way, as the most pragmatic way, the states try to liberate its defense industry and reinforce its arms in order to have more say in international politics. Further, they can empower their alliances by exporting arms and then exerting political influence.²²

In this context, Türkiye supports its geopolitical interests by using its most technological arms in regional conflicts. One remarkable example where the Turkish produced UAVs have been used is the Ukraine and Russia war. Bayraktar TB2 was sold to Ukraine in 2019, and it was quite successful in repelling the Russian army.²³ As an important trade partner, Ukraine's defense was crucial for Türkiye. By selling arms to Ukraine, Türkiye not only benefited economically but also protected its trade interests.

‘‘The production and use of national technology reduces Türkiye's foreign dependency and also facilitates the making and execution of a relatively autonomous foreign policy.’’²⁴ Following a Turkish national defense, arms not only played an important role in Ukraine but also gained important successes through...*especially various UCAVs exported to Azerbaijan by Türkiye during the 2020 Nagorno-Karabakh war played an important part in Azerbaijan's military victory.* Historically bounded with Azerbaijan, Türkiye's UAVs helped the country to take over decades-long invaded lands from Armenia. Karabakh is a strategically crucial point for a possible future land connection between Türkiye and Azerbaijan, which could geopolitically influence the dynamics of the region.

*Likewise, similar Turkish-made military equipment had a hand in defeating separatist elements in the defense of Tripoli, the capital of Libya's UN-recognized government...*²⁵ Libya stands out as a key country for Türkiye in the Mediterranean Sea and is crucial for securing Türkiye's Sea connection to the open seas and oceans. Similar to Azerbaijan, Türkiye's historical connection with Libya automatically involves Türkiye when its interests

²² Málnácssy 2022, 63.

²³ Yeşiltaş 2021.

²⁴ Erhan 2022, 155.

²⁵ Erhan 2022, 156.

are at stake. Türkiye's drone deployment in Libya brought victories against Haftar's Forces (Libyan National Army), which are backed by France, Russia, and UAE.

Turkish UAVs assisted the Government of National Accord (GNA), supported by the UN, in changing the course of the conflict and regaining territory it had previously lost in 2019. Rossiter and Cannon (2022) identified that GNA didn't stop there; by the middle of 2020, Turkish air defense systems and drones had assisted to the GNA, which has been supported by the United Nations, in regaining almost all of western Libya and had compelled Haftar and his influential allies from outside the country — most notably Russia, France, and the United Arab Emirates — to engage in negotiations.

Rossiter and Cannon imply that the cases of Turkish drone deployment in Libya and the Caucasus demonstrate how the country's drone usage started to fit neatly with its political goals and national interests, including its reputation as a major regional player, however, the cases in Syria and Turkey were driven by security risks and core national interests.

Impacts on Counter-Terrorism and Military Operations

Türkiye has been fighting terror since the 1980s in its southern borders. However, over the last 7 years, Türkiye has shown significant successes in counter-terror operations thanks to developments in its defense technology.²⁶

In these successes, for sure the involvement of the Turkish Armed Forces is undoubted. Málnácssy (found out that three particular factors govern the military involvement of the defense industry in Turkey. The Turkish armed forces' backing is mentioned in the first condition, and Turkey's competition with certain surrounding nations is mentioned in the second. Force projection capabilities are crucial due to the present Turkish military doctrine of enhanced defense and developing aspirations for regional power status. *According to the Turkish defense doctrine, threats to national security must be stopped before they reach national borders.*²⁷

In this context, Türkiye has been using domestically produced arms and vehicles in its counter-terror operations. Those early usages also created a base for tests of new technologies. Armed drones have been used by Turkish authorities to target terror groups both inside Turkey and over the border in Syria and northern Iraq since at least 2016.²⁸

The first kill by a Bayraktar TB2 drone was reported in September 2016 in an attack carried out against the PKK in the Çukurca in southeastern Turkey. Along its border with Iran and Iraq, as well as in Syria during Operation Euphrates Shield, Turkey concurrently employed the TB2 against the Islamic State of Iraq and Syria (ISIS). During Turkey's cross-border military operation into Syria, known as Operation Olive Branch, the military loaded four MAM-L munitions made by Roketsan onto the Bayraktar TB2. Nearly 30% of all terrorist kills, it is reported, were eliminated either directly or indirectly by TB2 drones.²⁹

²⁶ Erhan 2022, 144.

²⁷ Málnácssy 2022, 62.

²⁸ Rossiter and Cannon 2022, 215.

²⁹ Rossiter and Cannon 2022, 214.

A remarkable operation that Turkish UAV Bayraktar TB2 completed was the 2018 Sinjar Operation, during which so-called PKK seniors were killed. A collaboration between the National Intelligence Agency (MIT) and the Turkish military allowed the identification of targets and helped TB2s destroy them.

As it can be seen in the examples above, UAVs such as Bayraktar TB2 contributed to Turkish military in counter-terror operations as well as in intelligence, reconnaissance, and surveillance. Overall, domestically produced arms had quite a positive impact on decreasing the number of terror attacks against Türkiye.



Graph 1.

Number of Counter-terror operations and PKK attacks in Türkiye, Iraq, and Syria between 2015 and 2022³⁰

(Source: SETA)

Aside from counter-terror efforts, Türkiye has been utilizing its domestic defense in military interventions as well. Türkiye launched “Spring Shield” in 2020 in Syria following an attack on a Turkish military station. Türkiye, in “...the counter-attack destroyed dozens of tanks, armored personnel carriers, and ammunition depots.”³¹ A high number of Regime Soldiers were killed in the attack. Forbes also reported “...destruction of dozens of T-55, T-62, and T-72 main battle tanks, BMP-1 infantry fighting vehicles, Pantsir-S1 and ZSU-23 Shilka short-range air defense systems, and 2S1 and 2S3 self-propelled howitzers.”³²

In Libya, during the Operation Peace Storm, Türkiye backed GNA and utilized Turkish-made arms, and their impact was destructive. With the use of a shield that combined drones, electronic warfare, and precision strikes, the Turkish involvement enabled the GNA to destroy one tank, at least 44 military vehicles, and 11 Pantsir systems. “A critical moment came in May when Turkish drones, in coordination with Turkish warships, attacked the

³⁰ Düz and Üzen SETA 2023.

³¹ Rossiter and Cannon 2022, 214.

³² Roblin 2020.

strategic al-Watiya air base, about 80 miles south of Tripoli, allowing government forces to capture the base and ending the LNA's Tripoli offensive.'³³

Turkish drones came to the agenda once again when the conflict erupted in Nagorno-Karabakh in 2020. 30-year-long conflict was in silence for a long time. With the help of Turkish drones and political assistance from Turkey, Azerbaijan swiftly recaptured the majority of the area it had previously lost to Armenia, reuniting with it in Nagorno-Karabakh for the first time since 1988.³⁴

Turkish UAVs used by the Azerbaijani forces caused significant losses to the Armenian forces in terms of personnel, armed vehicles, and other defense systems. It was reported that Armenia lost *'...nearly 200 tanks, 90 armored vehicles and 182 artillery pieces were tallied by one estimate.'*³⁵

Most recently, Turkish drones appeared in the Ukraine- Russia war. Ukraine even used Turkish drones in its intelligence missions. Drones which were sold to Ukraine were Bayraktar TB2s, and they were used by Ukraine in 2021 to defend its eastern regions. Rossiter and Cannon reported that the TB2s demolished military targets and vehicles. Those drones proved that they have superiority over Russian systems. As a result, Ukraine managed to stop Russian forces from advancing across Ukraine.

Impacts on Economics

The national defense industry not only contributes in security and political means but also economic terms. First and foremost, the benefit is that the national defense industry lowers the degree of foreign dependency in purchasing and importing arms and military goods from abroad. Secondly, Málnácssy implies that revenues gained through export sales in the defense industry are crucial for the economies of countries and businesses in this industry generate enormous revenues, make large investments in numerous research projects and the development of cutting-edge technology, and hire a lot of highly qualified personnel.

Similarly, it is so for Türkiye, too. Point out that utilizing and producing domestic technology helps Turkey become less dependent on other countries while also enabling the country to develop and carry out a reasonably independent foreign policy. Additionally, Türkiye's economy benefits from the export of its domestically produced defense industry goods to its allies and partners. *'The production and use of national technology reduces Türkiye's foreign dependency and also facilitates the making and execution of a relatively autonomous foreign policy. Furthermore, Türkiye's export of its homemade defense industry products to its partner and allied countries both contributes positively to the country's economy...'*³⁶ In this context, Rossiter and Cannon (2022)³⁷ provide that according to data from the Turkish Exporters Assembly, for example, Türkiye's exports to Ethiopia were \$94.6 million in 2021.

³³ Rossiter and Cannon 2022, 215–217.

³⁴ Edwards 2023.

³⁵ Rossiter and Cannon 2022, 218.

³⁶ Erhan 2022, 144.

³⁷ Rossiter and Cannon 2022, 219.

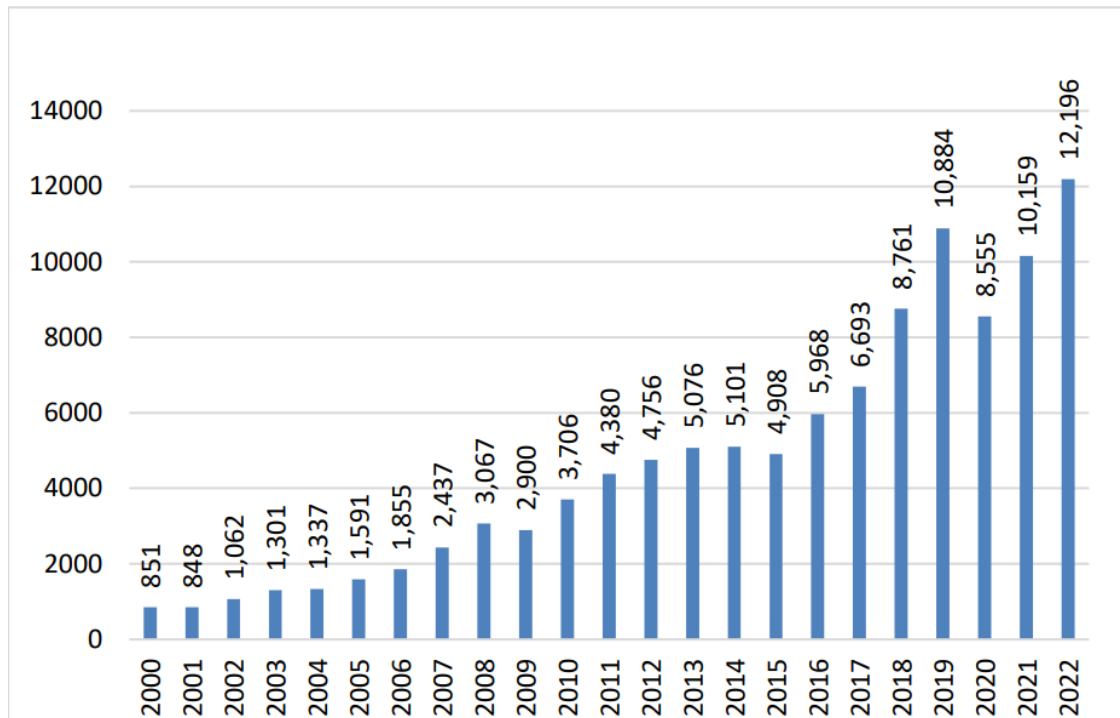
According to data obtained by SIPRI, the Sönmez (2019):

- Türkiye’s defense industry rose to sixth rank in Europe and fourteenth in the world,
- Türkiye was listed with 4 companies in the Top Global Defense Companies List in 2017.

Table 5.
Global defense Statistics vs Türkiye between 2002 and 2021
(Source: Business Diplomacy, 2025.)

Categories	2002	2007	2012	2017	2021
Military Expenditures of Turkey (\$ Billion)	11.1	9.3	10.3	13.8	16.7
Türkiye’s Global Ranking in Military Expenditures	18	20	20	18	18
Number of Turkish Defence Companies Included in the Top 100 Global Defence Companies List	0	1	2	4	3
Türkiye’s Share in Global Arms Exports	0.10%	0.13%	0.29%	0.37%	>1%
Türkiye’s Ranking in Global Arms Exports	17	19	16	14	≈11

Table 5 also shows the progress of Türkiye’s defense industry year by year and its growing share in world arms market. While Türkiye’s share in global arms export was 0.10% in 2002, it rose to 1% in 2021 by upgrading its rank to 11 from 17.³⁸



Graph 2.
*The Defense Industry Export Revenues Between 2000-2022 (in Millions \$).*³⁹
(Source: SIPRI; 2000 to 2023.)

³⁸ BusinessDiplomacy 2025.

³⁹ Yilmaztürk, 2023.

According to the Bastian⁴⁰ put forward that in order to remain profitable, Turkish defense companies proactively look for new markets to expand their foreign sales. Turkish exports, according to recent reports, increased from US\$1.9 billion in 2012 to US\$4.4 billion in 2022. In 2023, the same figure increased to US\$5.5 billion by increasing 27 percent.

Esen et al.⁴¹ found out that one of the greatest reasons that more and more countries are in the queue to order Turkish UAVs is affordability. Compared to the US equivalents, such as the MQ-9 Reapers, which cost 14 million USD in 2008, Bayraktar TB2s are 5 million USD in 2023.

Until now, for example, Bayraktar TB2s were exported to 24 countries, namely Qatar, Libya, Ukraine, Azerbaijan, Turkmenistan, Morocco, Ethiopia, Kyrgyzstan, Somalia, Pakistan, Djibouti, Burkina Faso, Rwanda, Togo, Niger, Nigeria, Poland, Romania, Algeria, Iraq, the United Arab Emirates, Bangladesh, Tajikistan, and Senegal. Recently, the Maldives purchased Bayraktar TB2s from Türkiye and became the 25th country that has purchased the arm.⁴²

Export sales of Turkish defense industry arms and vehicles contribute to Türkiye's economy considerably. Turkish President Recep Tayyip Erdogan announced that Turkish defense industry export sales reached 5.5 million USD in 2023. Taking the demand for Turkish UAVs into consideration, export sales of the Turkish defense industry are likely to increase and contribute to Türkiye's GDP more and more in the following years.

Consequences

Over the last two decades, Türkiye's military technology has advanced remarkably, which has had significant and varied reflections on the country's military power, geopolitical position, and economic prosperity. These reflections can be broadly divided into three main categories: economic gains, increased military operational capabilities, and geopolitical impact.

Advancements in Türkiye's national defense industry have had the most direct and noticeable effect on improving the Turkish Armed Forces' operational and strike capabilities. Those developments helped the Turkish Army evolve from a mostly land-based military force to a cutting-edge, contemporary military organization.

Türkiye has been able to conduct counter-terror operations with more efficiency and effectiveness thanks to the integration of drones and state-of-the-art infantry weapons. The Turkish military now has better surveillance, intelligence, and precision-strike capabilities, thanks to the deployment of UAVs like the Bayraktar TB2. These capabilities have been significant in the fight against terrorist groups such as PKK.

In addition to guaranteeing a consistent supply of military hardware, the capacity to construct complex systems like the T129 ATAK helicopters and the TAI Anka UAVs domestically has also come with the opportunity to customize these systems to fulfill unique operational requirements.

⁴⁰ Bastian 2024.

⁴¹ Esen 2023.

⁴² Domingo 2024.

This technological advantage has been most noticeable in operations such as Olive Branch, Euphrates Shield, and Spring Shield, where Turkish forces have proven that the newly produced military technology is successful and can neutralize threats with great accuracy and little collateral damage. Besides, the successful completion of these missions underlines the advantages in terms of operations that come from national defense industry development.

In addition to increased military capacity for Türkiye, the national defense industry also contributes to Türkiye's geopolitical aims. Türkiye's global influence has risen due to its military technological achievements. With less reliance on foreign military sources, Türkiye now has a higher level of strategic independence and more space to develop regional policies.

Ankara has been able to pursue a more forceful and adaptable foreign policy as a result of its independence, as demonstrated by its military operations in Libya, Ukraine, Syria, and Iraq, as well as its backing of Azerbaijan in the Nagorno-Karabakh conflict.

In addition to turning the balance in Türkiye's favor, the successful employment of Turkish-made drones and other military gear in these battles has shown the value of Turkish technology internationally.

Türkiye's geopolitical reach has been further expanded by the export sales of Turkish military equipment, particularly drones, to governments like Qatar, Ukraine, and numerous African countries. These exports are represented as a tool of soft power that strengthens Türkiye's position in strategic areas and promotes partnerships.

For example, export sales of Bayraktar TB2 drones to Ukraine and successful operations in its war against Russia have helped Türkiye to reinforce its position inside NATO as Türkiye has aligned itself with the West.

The last benefit is economic development. The establishment of a resilient defense sector has yielded significant economic advantages for Türkiye. With enormous income from both domestic and international sales, the military industry has grown to be a major contributor to Türkiye's economy. Major participants in the global military market, such as ASELSAN, TAI, and Baykar, have created jobs and driven technological innovation across various industries.

With initiatives like the production of the TAI TF-X (KAAN) 5th generation fighter jet, which promises to significantly enhance Türkiye's standing in the international defense industry arena, the country intends to continue developing its defense capabilities in the future. For Türkiye to continue to succeed, it will be essential to strike a balance between military development, economic expansion, and diplomatic ties in the international arena.

Consequently, Türkiye's national defense industry developments have improved the country's military capabilities, increased its geopolitical impact, and contributed to export sales. Türkiye is likely to become more significant on the international scene as it continues to improve and develop its national defense capabilities.

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