T.C.
ANKARA YILDIRIM BEYAZIT UNIVERSITY
GRADUATE SCHOOL OF SOCIAL SCIENCES

THE IMPACT OF MILITARY EXPENDITURES ON ECONOMIC GROWTH IN TURKEY

MASTER'S THESIS

MEHMET OĞUZ TAÇYILDIZ

DEPARTMENT OF FINANCE

ANKARA, 2021

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ONAY SAYFASI

Mehmet Oğuz TAÇYILDIZ tarafından hazırlanan "THE IMPACT OF MILITARY EXPENDITURES ON ECONOMIC GROWTH IN TURKEY " adlı tez çalışması aşağıdaki jüri tarafından oy birliği / oy çokluğu ile Ankara Yıldırım Beyazıt Üniversitesi Sosyal Bilimler Enstitüsü Maliye Anabilim Dalı'nda Yüksek Lisans tezi olarak kabul edilmiştir.

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Tez Savunma Tarihi: 18.08.2021

Ankara Yıldırım Beyazıt Üniversitesi Sosyal Bilimler Enstitüsü Maliye Anabilim Dalı'nda Yüksek Lisans tezi olması için şartları yerine getirdiğini onaylıyorum.

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BEYAN

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TEŞEKKÜR

Bu teze başlarken beni her anlamda özgür bırakan, bilimsel düşünceyi yasam biçimi olarak algılamamı sağlayan, her zaman beni destekleyen, bir öğrencisi olarak değil meslektaşı olarak gören ve bana hep güvenen sayın hocam Dr. Öğretim Üyesi Asuman ÇUKUR'a teşekkür gönül borcumdur. Sevgili eşime, canım kızıma sabırları ve destekleri ve en önemlisi beni hiç yalnız bırakmadıkları için sonsuz teşekkürler.

ÖZET

Yüksek Lisans Tezi

Türkiye'de Askeri Harcamaların Ekonomik Büyüme Üzerine Olan Etkisi

(2000-2020)

Mehmet Oğuz TAÇYILDIZ

Ankara Yıldırım Beyazıt Üniversitesi

Tez Danışmanı: Dr. Öğr. Üyesi Asuman ÇUKUR

Askeri harcamalarının büyümeyle ilişkisi literatürde çok araştırılan bir konudur. Bu tezin amacı Türkiye'de savunma harcamaları ile ekonomik büyüme ve ekonomik büyümeyle bağlantılı bazı makroekonomik göstergeler arasındaki ilişkiyi 2000-2020 dönemi için incelemektir. Tezde diğer çalışmalardan farklı olarak iki ayrı veri seti kullanılmıştır. Bu dönem için savunma harcamaları ve ekonomik büyüme ilişkisi hem uluslararası verilerden hazırlanan SIPRI veri seti hem de bütçe verilerinden hazırlanan veri seti olmak üzere iki ayrı veri setiyle Granger Nedensellik Analizi ile test edilmiştir. Analiz sonuçlarına göre, Türkiye'de savunma harcamalar ile ekonomik büyüme arasında çift yönlü bir ilişkinin varlığı tespit edilirken büyümeyle ilişkili olarak incelenen gayri safi yurt içi tasarruflar arasında tek yönlü bir ilişki bulunurken işsizlik ve dış ticaret dengesi rakamları ile savunma harcamaları arasında bir ilişki tespit edilememiştir.

ABSTRACT

Master's Thesis

The Impact of Military Expenditures on Economic Growth in Turkey

Mehmet Oğuz TAÇYILDIZ

Ankara Yıldırım Beyazıt University

Thesis Advisor: Assoc. Prof. Asuman ÇUKUR

The relationship between military expenditures and growth is a subject that has been extensively researched in the literature. The aim of this thesis is to examine the relationship between defense expenditures and economic growth and some macroeconomic indicators related to economic growth for the period of 2000-2020 in Turkey. Different from other studies, two separate data sets were used in the thesis. For this period, the relationship between defense expenditures and economic growth was tested with Granger Causality Analysis with two separate data sets, both the SIPRI data set prepared from international data and the data set prepared from national budget data. According to the results of the analysis, there is a bidirectional relationship between defense expenditures and economic growth in Turkey, while there is a one-way relationship between the gross domestic savings analyzed in relation to growth, but no relationship can be found between unemployment and foreign trade balance figures and defense expenditures.

TABLE OF CONTENTS

ÖZET……...i

ABSTRACT…….…. ii

TABLE OF CONTENTS……. iii

ICONS AND ABBREVIATIONS INDEX……... v

FIGURES INDEX…….vi

TABLES INDEX……..…...vii

INTRODUCTION……. 1

1. DEFENSE AS A PUBLIC GOOD AND ECONOMIC THOUGHTS ON DEFENSE....5

1.1 Defense as A Public Good…….5

1.2 Approaches of economic thoughts on military expenditures.……..…...6

1.3 Impacts of Military Expenditures on Economic Growth……...…8

2. LEVEL OF DEFENSE EXPENDITURES AROUND THE WORLD…….…...…...13

2.1 Level of Defense Expenditures……. ….…....13

2.2 Level of Defense Expenditures Around the World…….16

2.3 Level of Defense Expenditures in OECD Countries……...19

2.4 Public Defense Expenditures in Turkey……...……...25

2.4.1 Turkish Defense Ministry……29

2.4.2 Gendarmerie General Command…….31

2.4.3 Coast Guard Command……33

2.4.4 Turkish Police Service…….34

2.4.5 Turkish Defense Industry Presidency…….…35

2.5 Turkey Scientific and Technological Research Institution…….38

2.6 A Foundation Working for Public Benefits: Turkish Armed Forces ……40
Strengthening Foundation

2.6.1 Aselsan……42
2.6.2 Havelsan……...45
2.6.3 Roketsan……...45
2.6.4 Tusaş……47

2.7 Turkish Defense Industry…….…….…….....49

3. LITERATURE REVIEW……57

4. DATA AND METHOD…….…77

4.1. Dataset…….…77

4.2. Method…….…83

5. FINDINGS…….…….…86

6. CONCLUSION…….…….97

REFERANCES…….....100

ICONS AND ABBREVIATIONS INDEX

US : United States of America

UN : United Nations

IMF : International Monetary Fund

OECD : Organization for Economic Coordination and Development

NATO : North Atlantic Treaty Organization

SIPRI : Stockholm International Peace Research Institute

GDP : Gross Domestic Product

GDS : Gross Domestic Savings

ASELSAN : Military Electronics Industry

HAVELSAN : Air Electronics Industry

ROKETSAN : National Rocket Industry

TUSAŞ: Turkish Aircraft Industries Joint Stock Company

FIGURES INDEX

Figure 1. Defense expenditures for selected countries ……..……**17**

Figure 2. Defense expenditures for selected countries ……...**18**

Figure 3. Defense expenditures for OECD countries …….**19**

Figure 4. Defense expenditures for OECD countries …….**20**

Figure 5. Defense expenditures for OECD countries …….**21**

Figure 6. Government expenditures for selected countries ……**23**

Figure 7. Military Expenditure of US and rest of the world ……..….**24**

Figure 8. Military Expenditure of Turkey ……..….**25**

Figure 9. Public Defense Institutions Expenses …….**26**

Figure 10. Public Defense Spending ……..….**27**

Figure 11. Employment in Public Defense Institutions ……..….**28**

Figure 12. National Defense Ministry Expenditure Chart ……..….**30**

Figure 13. Gendarmerie General Command Budget ……..….**32**

Figure 14. Coast Guard Command Budget ……..…….…….**34**

Figure 15. Turkish Police Service Budget ……..….**35**

Figure 16. Defense Industry Presidency Budget ……**37**

Figure 17. Tubitak Budget ……..….**40**

Figure 18. Aselsan Sales ……**43**

Figure 19. Aselsan Balance Sheet ……..……**44**

Figure 20 Stakeholders of Roketsan ……...……..…..**47**

Figure 21 TUSAŞ Stakeholders……..….**48**

Figure 22 Turkey Defense Industry Export Figures……...**51**

TABLES INDEX

Table 1. Defense Expenditures for NATO, IMF and UN **……..…14**

Table 2. Targets of Defense Industry **…….36**

Table 3. Some Ongoing Defense Projects **…..…….38**

Table 4. Turkish Armed Forces Foundation Companies **……42**

Table 5. Aselsan Partnership Structure Chart **…….……42**

Table 6. Defense Industry Companies in Top 500 Companies (Turkey)……**49**

Table 7. Contribution of Turkish Defense Industry Companies to Employment **……...53**

Table 8. Top 100 Defense Industry Companies (World)**……54**

Table 9. Data of Turkish Defense Industry **……...….55**

Table 10. Variables Used in Research **…….……...…....78**

Table 11. Economic Growth Rates **……...……...…...79**

Table 12. Gross Domestic Saving **……...…...79**

Table 13. Balance of Trade **……...…….....80**

Table 14. Unemployment Rate **…….……...…...81**

Table 15. Defense Expenditures **……...……...…...82**

Table 16. Defense Expenditures **……..…….…...…...82**

Table 17. PP Unit Root Test Outputs **……...……...…...86**

Table 18. ADF Unit Root Test Outputs **……...…...87**

Table 19. Lag Selection Criteria **……...……...…...89**

Table 20. Causality Relationship Between Military Ex.(SIPRI) and Ec. Growth**…….....90**

Table 21. Causality Relationship Between Military Ex.(SIPRI) and Trade Balance **…….90**

Table 22. Causality Relationship Between Military Ex.(SIPRI) and Gross Doms Sav.....**91**

Table 23. Causality Relationship Between Military Ex.(SIPRI) and Unemployment**…....92**

INTRODUCTION

The need for defense started with the beginning of humanity and took its place as one of the most fundamental rights with the formation of states. States have made great efforts to build the future of their countries and to leave a more livable, socially developed and safe homeland to the next generations. Since sovereignty is in question, the need for defense is inevitable for all states. However, it has always been an important discussion topic how much share the states will allocate for military expenditures while planning their limited budgets. In order to both ensure the security of the country and earn the title of an investable country, an optimal budget should be allocated for defense needs. While determining this optimal level, the effect of military expenditures on economic growth and some macroeconomic indicators related the economic growth should not be ignored.

The need for defense and expenditures to meet this requirement have existed since the formation of the first states. Security is located immediately after physiological requirement in the Maslow Needs Pyramid. Meeting this basic need has always been one of the basic duties of states. In this context, states have created armed forces against both domestic and foreign threats. Reasons such as internal and external threats, geographical location of countries, proximity to energy corridors and arms race directly affect the size of these armed forces (Sipri, 2018).

The issue of how military spending has an impact on the economy has always been one of the issues discussed. *Classical economists* approached the issue with the negative effect of military expenditures on the macroeconomic indicators and especially economic growth. According to classical economists, not only military spending but also all compulsory public spending is a heavy burden on the state. Their main argument claim that the market spontaneously reaches the optimal balance in line with the personal interests of actors outside the state and full employment is provided. In this sense, the states should keep military spending to a minimum level. On the other hand, economists who adopt Keynesian Economic Theory brought a different perspective to the issue after the 1929 Depression. According to them, state military spending as one of the public expenditures increase the demand and this increased demand cause a multiplier effect in the market. Thus, this enhanced military spending may cause to increase economic growth in the country (Rothschild, 1995).

In the light of all these views, it is important to note that military spending is outside the initiative of states in globalized world. Because to ensure the security of its citizens and to exist as an independent country is beyond all economic plans. Adam Smith, the founder of classical economics, stated that security is the foundation of everything with the famous saying "Security is more important than welfare" (Rothschild, 1995). Because security is very requirement especially for foreign investment. Stability and trust are the most important criteria for international investors to determine countries which they invest.

Goods in which the consumption of one person does not cause a decrease in the consumption of the same goods by other individuals are called public goods. These products are divided into two groups as semi and pure public goods. The goods whose benefits cover all the public are called pure public goods. In addition, they are priceless and nobody in the public cannot be excluded from these goods (Kayıran, 2013). Defense service is one of the three aspects that are considered as a full public good, together with justice and diplomacy. So, even though military expenditure is discussed regarding their role in the economies, it is an inalienable right for every citizen of the states.

Academic studies on the subject have different results on the impact of military spending on the economy using different indicators like economic growth, employment and budget deficit. According to the results, this effect on the economy may vary from country to country, depending on the level of development, period-to-period, and based on geography as well as conflict environment. (Zhong, 2016).

There are some channels that military spending can positively or negatively impacts economic growth. Military spending may effect economies negatively by two channels. Firstly, since public resources are limited they may create opportunity costs due to the shares allocated to defense expenditures. Because, sacrifices are made primarily in the productive fields like education, energy, R&D and technological investment and this situation may cause countries to remain economically behind. When countries may not grow economically then fundamental economic problems may arise. In addition, financing of military expenditures can be considered as a second channel which may affect economic growth negatively (Yıldırım and Öcal, 2014).

Military expenditures may be financed by cutting other productive public spending or by creating a new fund like new taxes or borrowing. Thus, with this increased burden for the economies, interest rates and inflation may increase and these economic conditions may cause to shrink in aggregate demand (Yıldırım and Öcal, 2014).

On the other hand, benefits of military expenditures on the aggregate demand can be considered as a channel which effect economic growth positively. According to this channel, technological spin-offs and enhancing the capacity of infrastructure and human capital may increase economic growth. Moreover, reducing the unemployment and foreign dependency and creating a secured country to encourage foreign investment can be considered as other channels which trigger the economic growth. Because, security is not for only citizens and it is necessary for economy and without this secured environment, there will be no economic actor who invest internally or externally (Bilişli, 2011).

Some countries which do not depend on foreign technology and produce technology in the defense industry received positive economic indicators in return for increasing defense expenditures. For example, military spending in South Korea and Taiwan created very positive reflections in the economy. Despite high military spending in both countries, very high growth rates were obtained. Successful economic policies of the countries have a great influence on the success of this process. States have succeeded in minimizing negative externalities like crowding out of productive investments and education, science and art expenditures that military and other public spending can create (Heo, 1997).

In addition, according to the latest report of the International Institute for Peace Research in Stockholm, arms sales increased by approximately 5 percent in the 2015-2019 period compared to the previous period in the worldwide. The United States achieved the biggest share in arms exports with a value close to 40 percent. According to the report, more than one of every three weapons produced in the world is produced by America. Russia, France and Germany followed America. The United States, which has large proportion of this cake, makes more than half of its exports to the Middle East countries. The largest share among the Middle Eastern countries belongs to Saudi Arabia, which increased its military spending during the Yemeni war (Sipri, 2019).

On the other hand, 10 out of fifteen companies selling the most military supplies and weapons in the global market belong to the United States. The total sales of the 14 biggest defense industry companies in the USA are about 200 billion dollars. This is even more than 75 percent of the sales of companies in the top 20 worldwide. The United States ranks first among countries that naturally benefit from increased tension, conflict and wars worldwide. (Eğilmez, 2018)**.**

In addition, defense budget need is always very important for Turkey both its geographic location because of a bridge role between Europe and Asia, its strategic location due to proximity to the conflict region and natural energy resources, and ongoing conflict and tensions with terrorist organizations and neighboring countries. Turkey uses a significant portion of its GDP for military purposes to compete with all these threats, to obtain rights from energy corridors around the country, and in order to make the country attractive for investors. In addition, having the region's largest and technically rapidly developing army cause to increase in this budget (Sipri, 2018).

As a result, although country budgets and resources are limited, military spending is mandatory for all countries to create a suitable trade environment for foreign investors. Later, the issue of how scarce resources will be shared and how big a defense budget will be created will be on the agenda. The main point to be considered here is the level of military spending and how it will be financed. Evaluating the reflections of externalities on the economy is another crucial point. Decreasing foreign dependency in the defense industry and exporting technology by industrializing in the subject will be very decisive. Thus, by increasing the country's export figures, the budget deficit may decrease and unemployment problem may be eliminated to a great extent thanks to the personnel employed in the established factories.

Within the framework of all these evaluations, defense as a term has been evaluated in the light of different economic thoughts in the first chapter. In the second chapter, military expenditures made in Turkey and in the World analyzed and Turkish Armed Forces Foundation and its subsidiaries are evaluated and interpreted with comparative graphics and analyses. Then a literature review was made and academic studies on the subject were examined in the third chapter. In the fourth and fifth parts, the relationship between military expenditures-economic growth and some macroeconomic indicators related to economic growth is examined by making Granger Causality Analysis.

FIRST PART

1. Defense as a Public Good and Economic Thoughts on Defense

1.1 Defense as a Public Good

The defense is a pure public good and every country whether they are in war or in peace, have a certain amount of defense expenditures. However, this level of expenditures changes depending on many factors like conflict environment, terrorist acts, level of development, armament race, time period, scarce natural resources, and geography. The entire burden of military spending is covered by the state budget and it is the primary duty of governments. Therefore, the source of these expenditures comes from the state budget. But, in some exceptional countries, various extra-budgetary revenues and funds can also support defense spending. For example, in Chile, like many South American countries, in addition to central government budget revenues, extra-budgetary resources are used to finance defense spending. Ten percent of copper export revenues in the country is allocated to the purchase and repair of weapons and equipment of the armed forces of the country (Yıldız, 2018).

Because of some reasons such as scarce natural resources, regional threats, and arms race worldwide it is not possible to risk national security by cutting off defense spending. In addition, creating a secure environment is a prerequisite for states to make country attractive for internal and external investors. For this reason, it is more important to control to what extent the shares allocated for defense are used effectively and efficiently rather than cutting the military expenses completely. Along with democratization and accountability, the increase in transparency of defense expenditures and inspection by internal and external audit bodies increased efficiency in expenditures, decreased waste and the shares allocated from the budget decreased (Sipri, 2016).

However, despite all positive developments, there are still ongoing and unchanging problems regarding the transparency and accountability of military spending. It is possible to collect these problems under five main headings: weak and non-democratic political governments, security concerns, discretionary funds, follow-up and control problems, and corruption (Sipri, 2018).

Military spending cannot be checked and monitored transparently, especially in underdeveloped and developing countries. Because of both the technical insufficiency to control military spending and the political reluctance of politicians in this regard it is not easy to check the budget of the military. Political administrations mostly ignore the expenditures in this area, which is almost regarded as an "inaccessible area". Another problem with the transparency of defense spending is security and privacy concerns. Both the ongoing threats related to national security and the weakness and fear of civilian political administration in the face of military administration within the country cause elected administrators to ignore the observation and inspection of defense spending. On the other hand, another factor in the fact that military spending cannot be clearly identified and controlled is the shares allocated from non-budgetary sources to military spending. In almost all developed and developing countries, apart from the official budget figures approved by the parliament every year, there are funds called “discretionary funds” that can be approved and used by the heads of countries. Because of its quintessentially, the use of these extra-budgetary funds is closed to all types of internal and external inspections (Kahraman, 2014).

These problems regarding the transparency and control of defense expenditures make it difficult to follow up, check and control these expenditures, and this causes an increase in corruption and waste problems. Especially in underdeveloped and developing countries, it was observed that payments were made to ghost soldiers and troops, and corruption and procurement of weapons and ammunition were made. Especially in some of the underdeveloped African countries, similar situations occur frequently. Thus, as the resources allocated to strengthen the army are wasted, this may cause armies of these countries to remain weak in terms of technical equipment (Sipri, 2016).

1.2 Approaches of economic thoughts on military expenditures

The need for defense and expenditures has existed since the formation of the first states. Although the existence of military spending dates back to ancient times, the impact of these expenditures on the economy started to attract the interest of researchers especially after Great Economic Depression and Second World War. Especially, economic turndown after the oil crisis and increased armament with respectively Cold War, Arab-Israel war and Gulf Crisis caused to countries to sharply increase the rate of their defense budget. Naturally,

the effecting of these huge defense budgets on the indicators like economic growth, employment, budget deficit, and inflation were started to search by researchers.

All economic schools evaluated public spending from a different perspective. Adam Smith, who is known as the founder of modern economics, and other classical economists stated that the state expenditures should be limited, except in very essential situations. However, economists who adopted the Keynesian view argue that the intervention of the state in the economy is compulsory; otherwise, economic growth could not be achieved (Yağtu, 2019).

According to the classical economic view, the main solution for the revival of the economy and the achievement of sustainable economic growth is the release of the market in a way that will be managed in line with the personal interests of the market actors. Because the interests of the market actors and the interests of the state always overlap. As the classics say, an invisible hand comes into play and the market is balanced to the appropriate level of value. Thus, the economy automatically turns towards full employment, and economic development is achieved. Naturally, according to economists who adopt this view, all public spending is nothing but waste and extravagance. In this sense, the state should not spend in any field other than justice, diplomacy, and defense, which are considered as full public goods as these areas are far from productivity. Therefore, these expenses are irreversible to the market and can be considered as waste. Also, increasing military spending causes limited resources not to be used for productive fields like health, education, infrastructure, and R&D and development projects (Yağtu, 2019).

These developments may occur as negative indicators for economic growth. In addition to the negative impact on economic growth, other economic indicators are negatively affected and income distribution is disturbed. Another criticism of the classics on the subject is that qualified skilled labor force cannot be allocated to other productive sectors due to the use of skilled labor in the defense industry (Deger, 1986).

After many years under the influence of Classical Economic Theory, the world gave a great economic test in 1929. In the periods when there was little state intervention in the economy after the First World War, the US became the superpower that ruled the world markets. However, the mortgage crisis that started in the US spread all over the world and millions of people became unemployed as the hundreds of companies and banks collapsed in turn. In this process, people could not withdraw their money from banks and lost all their

savings. This process led to the loss of trust in the market. In addition, people have been reluctant to continue their spending largely due to their insecurity in the market. This situation caused a great recession in all world markets. Keynes argued that it is not possible to recover the lack of demand in the market without government intervention. According to Keynes, state intervention is essential to restore growth in the economy and to ensure sustainable development, to establish a fair income-wealth distribution, and to ensure economic stability (Howitt, 2006).

According to Keynes, states mainly use two basic instruments to stimulate market demand. These are taxes and public spending. The factor that enables increasing demand and increasing growth by using public spending is the 'multiplier mechanism'. According to Keynes, defense spending raises the consumption rate in the economy through the multiplier mechanism. The unemployment rate in the country decreases as the number of personnel to be employed by the armed forces, gendarmerie, coast guard, and police offices within the scope of the defense needs of the countries may increase. On the other hand, ensuring "specialization" in the defense industry and increasing R&D efforts cause the country to achieve its technological transformation (Esgin, 2010). As a result, according to the general assessment of Keynesian and Post-Keynesian economists, the increase in military spending ensures sustainable growth in the country with positive externalities caused by education, infrastructure, R&D, and technological specialization.

1.3. Impacts of Defense Expenditures on Economic Growth

The worth of all final products which were produced during a period in the country is called GDP. In addition, the sum of consumption, investment, and public spending on goods and services in the country can be evaluated as GDP. Countries in today's world; due to the various political and economic factors which they in, their geopolitical and geographical location, and the international defense organizations they belong to, spend some of their GDP on armament, membership fee, and military material manufacturing-imports.

The theories of economic growth, influenced by the economic and social conditions of the current period, forced the state to fulfill different duties in the economic and social field. In growth theories, while the state is sometimes given an active role in the field of economic growth, sometimes it is given a passive role and it is argued that the state should not intervene in the economy. For example, according to the mercantilists, the strong state is the main

goal. The elements to be obtained in this way are to have precious metals and to liberate foreign trade. On the other hand, physiocracy is a thought that was born as a reaction to the mercantilist thought and advocates that the state should not intervene in the economy. According to them, agriculture, which is the main sector in the economy, is the only way to grow because it gives more than it spends. The physiocrats, who did not care much about the benefit of the industry, did not give importance to trade, unlike the mercantilists. Smith, the leader of classical thought, stated that not only capital flows, but also the technological process and industrial and social factors play a vital role in the economic growth process of a country. In the so-called Keynesian growth model, it is stated that state intervention is necessary for the realization of economic growth. This growth model is aimed to mobilize the market and provide economic growth by using government expenditures or taxes (Özel, 2012).

In addition, the theories classified as 'external growth theories' tried to explain growth through variables that are independent of the internal dynamics of the economy. These theories evaluate that external borrowing will increase economic growth in developing countries. However, internal growth models reveal the importance of the state in the economy and they think that there should be an uninterrupted growth mechanism in developed economies. The state establishes an open economic system by providing better quality health and education services, encouraging R&D and technology transfers, protecting property rights, and strengthening communication networks. In addition, the state again takes an active role in the economy by removing the barriers to competition. In summary, endogenous growth theories create economic growth within the system (Özel, 2012).

We can say that political factors have the biggest share among all the factors affecting the size of military expenditures. On the other hand, political elements are a multidimensional phenomenon that includes many variables. Sub-titles such as international military organizations to which countries are members, political regime of the country, sectarian and racial tensions, relations with neighboring countries, natural resources owned, and the arms race are evaluated within the political elements. Although countries have different economic structures, their military spending does not show parallelism with their economic structures. Because countries have to maintain their national independence at any cost and eliminate the threats in the country. After the great recession in 2008, there was a table supporting this situation in the USA. Almost all sectors have suffered from this crisis

with great damage, but arms manufacturers have managed to increase their revenues by about 1% (Yağtu, 2019).

The geographical and geopolitical locations of the countries stand out as one of the factors that directly affect the size of military spending. For instance, Switzerland which is far from political threats in the middle of Europe is lucky in this regard. However, Turkey located very close to all the political threats in the Middle East is not as lucky as Switzerland. For example, since Switzerland does not have a coast, there are no naval forces. Military spending in Switzerland constitutes 0.9 percent of GDP (Sipri, 2018). Yet the situation is very different in Turkey. In the country, which is surrounded on three sides by the sea and has a transition route between Asia and Europe a strong Navy is needed.

Whether the military expenditure is productive spending for the economy of a related country is very determinative to assess the effect of military expenditure on economic growth. Thus, we can associate the benefits and costs of military expenditures regarding their productivity or unproductivity.

Productive military expenditures may cause to positive influence on innovative military technology, security, export rate, new working areas, and army to become a deterrent force. On the other hand, unproductive military expenditures may cause a negative influence on imports, foreign dependency, rising taxes and borrowing, skilled labor loss, and opportunity cost (Deger, 1986).

An increase in military spending in some periods may affect the national budgets of the countries and all economic dynamics closely. Because increasing military expenditures may make it necessary to decrease other expenditure items especially in countries belonging to lower and middle-income groups. Increasing budget deficits and compromising fiscal discipline are among the other risks that may arise from defense spending. The financing method of the burden of military spending on the economy in these periods will be directly determinant on the economies of the countries.

In addition to the debt stock that may occur in the local market, military spending covered by imports may lead to an increase in the current account deficit and pressure on foreign currency. This increase in the exchange rate and debt stock may have negative effects on basic economic indicators such as growth, inflation, interest, and income distribution. In summary, the number of military expenditures and financing methods may reveal negative externalities depending on the economic position of the country in question. In fact, the vast

majority of studies on the subject from the past to the present emphasize the abundance of negative externalities caused by military spending (Ulusoy, 2018).

On the other hand, as seen in developed and some developing countries that export technology, the technologies developed by the states for armament are also used in private sectors to encourage the use of advanced technology and have a direct impact on the development of countries. In fact, countries can achieve positive externalities by channeling their military spending to R&D, advanced technology production and use, innovation, and specialization by using innovative technologies based on export (Ulusoy, 2018).

In addition, correctly determining the military spending level is an important criterion. Increasing military spending can have negative effects on economic growth and some variables which are a close relationship with economic growth such as inflation, debt stock, exchange rate as well as providing positive effects such as introducing new technologies, increasing R&D capacity, decreasing imports, increasing exports, and decreasing unemployment.

In this regard, when the basic problems of countries that are stuck in the middle-income trap and cannot be in the upper-income group are examined; the existence of a lack of technological innovation and specialization is considered as an important problem. Regarding the military industry statistics, two giant monopoly countries in the defense industry such as the USA and Russia provide great economic support to their countries thanks to their international companies which dominate the world defense industry market (Ulusoy, 2018).

A country may pass to upper-income countries level with its defense industry investments. An export-based defense industry that produces innovative and high technological products may cause to decrease budget deficits of related countries which face with middle-income trap problem. In addition, the hot money flow which was obtained with this expanded export level may trigger the demand level in the countries Thus, these positive economic indicators may affect and expand the economic growth (Deger, 1986).

Also, the unemployment level may shrink positively by means of expanded defense industry and huge companies. However, if the states cannot manage these processes, there would occur some negative reactions for their economies in the long term. Because these high technological and innovative industries need well equipped and qualified labor force. This labor force maybe satisfies with low wages during the establishment process of these

companies. However, these qualified labor forces can find new opportunities in a globalized world and may demand high wages in the long term. Thus, increasing these costs may cause negative effects on price levels and accordingly inflation (Deger, 1986).

SECOND PART

2. Level of Defense Expenditures around the World and in Turkey

2.1. Level of Defense Expenditures

It is very difficult to define defense expenditures clearly and determine what they cover. In general, all expenditures incurred in the defense of a country can be termed as 'defense expenditure' or 'military expenditure' (military expenditures and defense expenditures are used interchangeably in this study). All kinds of expenditures which were spent for ensuring the national security of the country such as the supply of military equipment, construction, maintenance, repair of the military facilities, personnel salaries, and civil defense are considered as defense expenditures. Although the expenditures made by the countries for their armies are considered as military expenditures, there are many other issues that can be considered under the heading of military expenditure. Because geostrategic positions, relations with the neighboring countries, proximity to the regional threats, underground and above wealth, proximity to international trade routes, political regimes, the ethnic structure, and educational level of people may cause the changing of defense structure of countries (Sipri, 2016).

In this context, there is no clear worldwide accepted practice regarding which expenditures will be evaluated under the military expenditure heading. Apart from the armed forces, the use of gendarmerie, coast guard, and police for defense purposes, military investments and projects made with state-private sector cooperation, roles taken in international organizations, war debts, the support given to peacekeeping operations in different parts of the world, military intelligence budgets, secret projects, and grants made for military purposes to other countries may change the definition of 'military expenditure' from country to country.

Types of Expenditure	NATO	IMF	UN
Payments for officers and other military personnel	A	A	A
Civil servants and workers in the armed forces	A	A	A
Costs of privileges provided to all employees and their families	A	A	A

Retired payments	A	A-	A
Expenditures for military facilities	A	A	A-
Weapon and equipment purchases	A	A	A
Infrastructure and superstructure expenditures	A	A	A
Maintenance and repair expenditures	A	A	A
R&D Expenditures	A	A	A
Other requirements	A	A	A
Stock expenses of strategic goods	A+	A-	A-
Maintenance of warehouse and production facilities	A+	A	A-
Incentives for defense industry	A	A-	A-
Military aids sent to other countries	A	A	A
Contributions to international treaties	A	A	A-
Civil defense expenditures	A-	A	A
Payments to war veterans	A-	A-	A-
War debts	A-	A-	A-
Expenditures to Gendarmerie	A*	A*	A*
Expenditures to Police	A*	A-	A-
Expenditures to Customs enforcement	A*	A*	A*
Rescue operations from natural disasters	A	A-	A-
Expenditures for UN peace keeping operations	A	A	A-
Credit support	A	A	A-

Table 1: Defense Expenditures for NATO, IMF and UN

Source: Brzoska, 1995:48-49, Giray, 2004:184-185, Asiloğulları, 2019
Symbols

A Considered as defense expenditures

A- Not considered as defense expenditures

A+ It is considered as defense expenditure if it is financed by defense organization

A* It is considered as defense expenditure if it is used for military activities

Many organizations in the world have conducted studies to define the definition of military expenditures. In this context, organizations such as NATO, IMF, UN, and SIPRI have defined different military expenditures from each other. NATO, the largest military alliance established for defense purposes with its 30 member states, has classified its defense expenditures under six main headings. NATO accepted all payments for the armed forces (including employee and retired military personnel salaries) as its main defense expenditure item. The land, naval and air forces of the countries, as well as their Special Forces and logistic commands, are considered as the constituent elements of the armed forces. Incentives for the defense industry and contribution payments made within the scope of international agreements and military aid to other member countries are also determined as other main criteria. Unlike other organizations, NATO includes the expenditures made by the countries for the police as an item of military expenditure for these reasons;

a. the gendarmerie, coast guard, and police elements are actively used within the scope of the counter-terrorism operation both inside and outside the countries,

b. they take part in many local and international operations, with the special operations units they have,

c. gendarmerie and police elements are still on duty at many bases and checkpoints in different countries,

d. police and gendarmerie elements actively participate in peacekeeping operations with the UN and NATO,

e. the armed forces, gendarmerie, coast guard, and police elements carry out joint operations within the scope of the fight against terrorism within the countries.

f. as an element of the defense policies of the countries, they engage in activities to combat criminal organizations, smuggling, and immigration (NATO, 2017).

In addition, NATO and UN considered all expenditures made by countries within the scope of peacekeeping operations as military expenditures. Apart from NATO, the UN and IMF make different definitions of what defense spending might be. While NATO accepted

the incentives for the defense industry as defense expenditure, the UN and IMF do not consider these expenditures under the title of defense expenditure. As a result, there is still no clear consensus between countries and international organizations on what items defense spending will consist of (Sipri, 2019).

The most famous international defense organization NATO has 55 percent of defense expenditures around the world. According to the 2018 year SIPRI Database, military expenditure of NATO America which consists of the United States and Canada, to total NATO expenditures is 74%. Since the military expenditure of Canada consists of only 0,2% of total NATO expenditure, it can be seen that United States has the biggest share of total NATO expenditure. In addition, the military expenditure of Turkey to total NATO expenditures is 1,3% (Erdem and Sezgin, 2018).

In addition, countries consider all the political and geographical conditions and analyze the risk factors for them. Countries that see the intense threat factors may join their forces by forming alliances since they do not have sufficient resources for defending themselves. On the other hand, countries that do not have serious threats towards them do not need to be members of alliances. For example, Switzerland, which is far from political and geographical threats, preferred to remain military-neutral and not to be a member of any international organization. For this reason, the Swiss army is not involved in any joint UN Peace Force operations in other countries. The cost of joining military alliances varies from country to country. The high-income group developed countries use labor force of ally underdeveloped countries. In this way, both developed countries reduce their production costs, and underdeveloped countries can find solutions to unemployment problems (Sipri, 2016).

2.2. Level of Defense Expenditures around the World

As well as increasing and decreasing in some periods, military expenditures are ever-present spending for states for all periods. A substantial part of the budget consists of military spending in most of the countries around the world. While total military expenditure around the world is approximately 1.7 trillion-dollar, it was seen that the American continent has approximately 700, Europe has 350, Africa has 40 and Asia has approximately 450 billion dollars' military expenditure (Erdem and Sezgin, 2018).

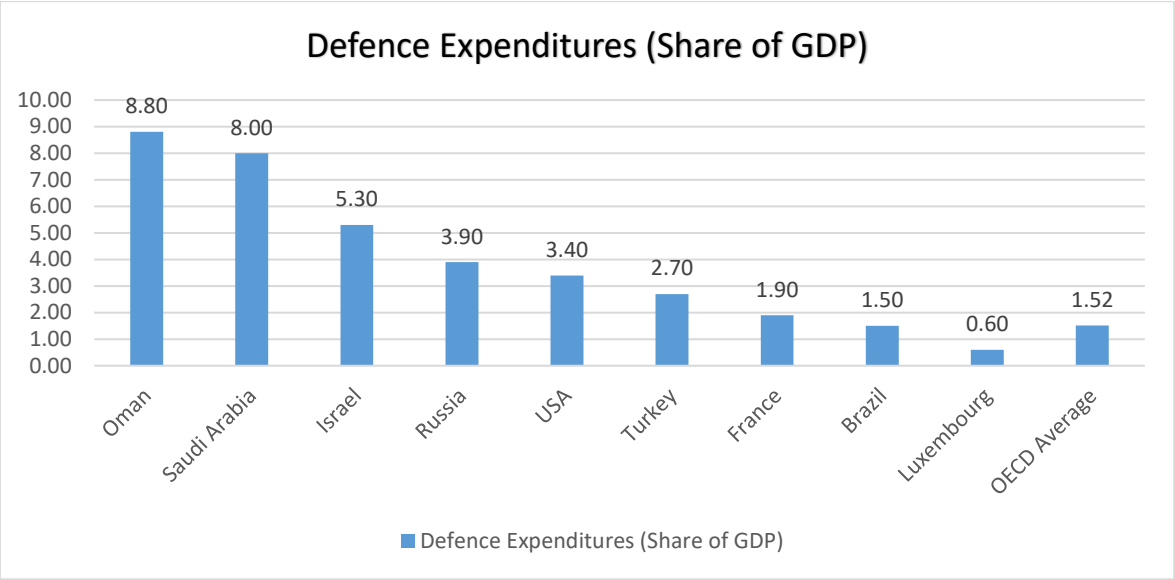


Figure 1: Defense expenditures for selected countries

Source: Sipri, 2019 (Some Selected Countries)

With some other crucial reasons, geographical unrest and political conflict are the most essential criteria which cause increase military spending. As can be seen from the above graph showing the countries that allocate the most and the least share of their GDP to military expenditures, Oman, which struggle with civil war, Saudi Arabia, which try to manage the world oil market with its abundant oil resources, and Israel, which is the main cause of the regional conflict in the Middle East with its aggressive state policies, are the countries with the highest ratio in terms of military spending and GDP relation (Sipri, 2019). With a poverty rate well above the OECD average (approximately 25%) and a very bad picture in terms of income justice, Israel has implemented a long-term defense vision to alleviate fiscal concerns, reduce the budget deficit and public spending. According to this vision, the main goal is to prevent defense expenditures from exceeding 6% of GDP and 15% of public expenditures. Although defense spending contributes greatly to the development of Israel's technology and industrial capacity, it has been announced that defense spending will be cut in order to reduce the heavy burden it puts on the public. While the budget allocated for defense expenditures was approximately 20 billion dollars as of 2006, the defense budget decreased to 15 billion dollars in the following years and the ratio of the country's total government debt to GDP decreased to 60% as of the end of 2015 (Yıldız, B. and Yıldız, G. 2018). However, contrary to all these countries, Luxemburg has the lowest ratio because of its geographical position which is far from conflict regions.

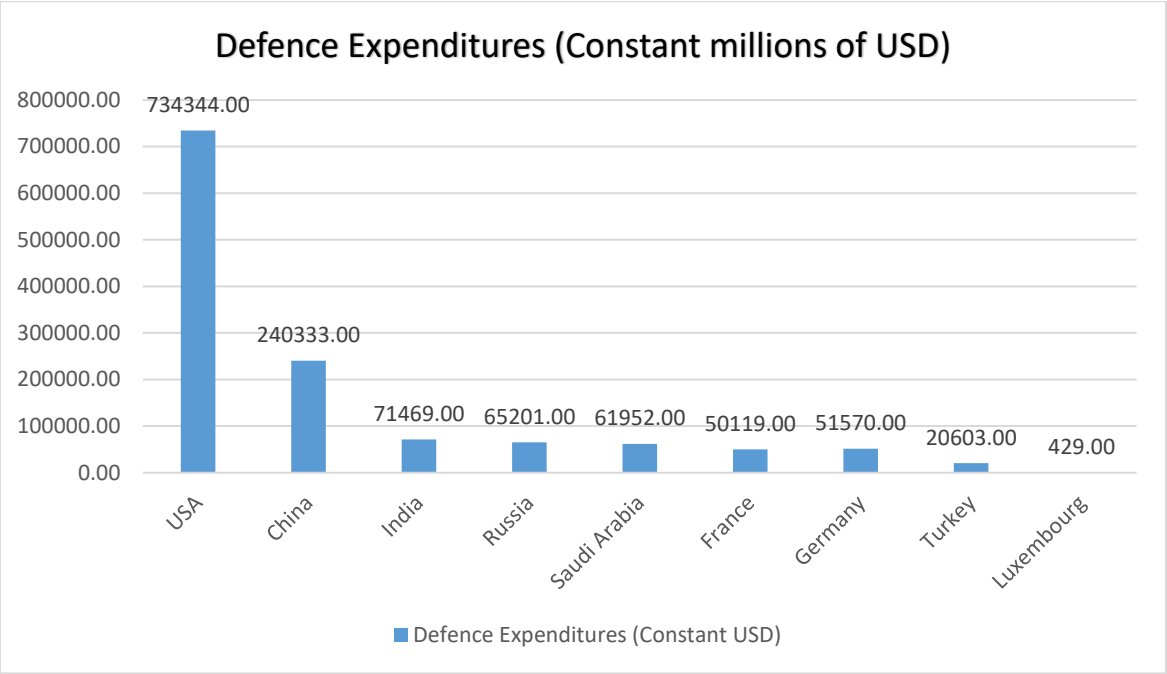


Figure 2: Defense expenditures for selected countries

Source: Sipri, 2019 (Some Selected Countries)

Although Oman is the country that allocates the largest share to defense expenditures in proportion to its gross domestic product, the USA makes the biggest defense expenditure in the world. The USA is followed by China and India, which are the most populous countries, respectively. Saudi Arabia which tries to manage the oil source market in the world follows them (Sipri, 2019).

Lots of factors affect the defense expenditures level of countries. These factors may change from country to country. However, there are some cases that can influence all the countries at the same time like the Covid-19 pandemic. All the countries arranged extra budgets to struggle with this mortal virus. Thus, while they plan these new budgets, of course, they were forced to cut other budget items like education and infrastructure. However, we need to evaluate defense expenditures except for this situation. Because, although their shoestring budget, some of the countries signed new contracts for arms supply (Sipri, 2021).

According to Sipri (2021), United States keep its position as a leading arms exporter country during the last five years. The biggest importers of the United States are Middle East Countries with 47% and Saudi Arabia with 24%. The second leading arms exporter country Russia, third France, and fourth Germany also increased their arms exports in this period.

While India, Egypt, and Qatar are importers of France, Korea and Egypt are importers of Germany which increased its export level 21%. As seen from statistics, especially Middle East Countries that struggle with issues like East Mediterranean Sea gas reserves, oil sources, internal disturbance, and denominational conflicts are the biggest arms importers (Sipri, 2021).

2.3. Level of Defense Expenditures in OECD Countries

The OECD was founded after the Second World War to help the distribution of the financial support of the North America Countries in line with a Plan which was designed by Marshall and to support their economies by liberalizing commercial payments between European countries. The OECD was founded in 1960 with the "Convention on the Organization for Economic Co-operation and Development" agreement. OECD is an organization where 37 countries with different financial structures work together to untie the socio-economic, and management problems caused by globalization and to gain favor from this process (Eğilmez, 2018).

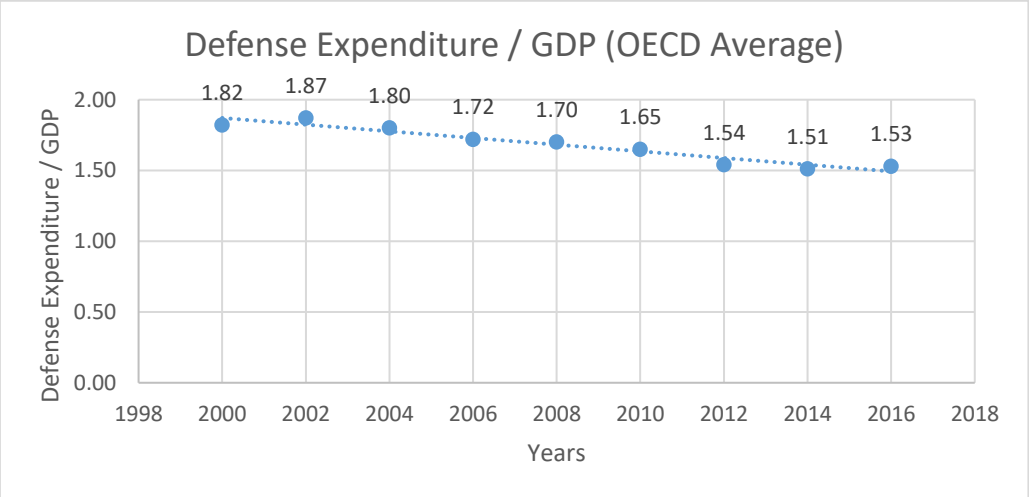


Figure 3: Defense expenditures for OECD countries

Source: OECD, 2019

Military expenditures of OECD Countries which started to increase sharply after the Second World War kept its graphics with the effect of the oil crisis, gulf war, regional conflicts, and the 2001 terrorist attacks. Military expenditures of OECD Countries which started to increase sharply after the Second World War kept its graphics with the effect of

the oil crisis, gulf war, regional conflicts, and the 2001 terrorist attacks. Decremented military expenditures in OECD Countries after the 2008 big recession, started to increase with the intent of controlling the world oil and gas reserves, regional conflicts, and trade wars between the USA and China between 2010 and 2019 (OECD Report, 2019).

On the other hand, OECD governments prefer to reduce their share of public investments while maintaining basic public services (which directly affect citizens' satisfaction), particularly because of political concerns. Despite the low-interest rates, the share of public investments in GDP declined from 4.1% in 2007 to 3.2% in 2018 across OECD. The countries with the highest public investments compared to GDP have been Eastern European countries such as Hungary (6.7%), Slovakia (6.4%), and Estonia (5.2%), which benefited from the European Union funding in recent years. In Turkey, this rate was 2.9% and it was close to the OECD average in 2018. While nearly a third of the government investments are allocated to transportation and energy fields across OECD, a considerable portion of 15% is spent on defense industry expenditures (OECD Report, 2018).

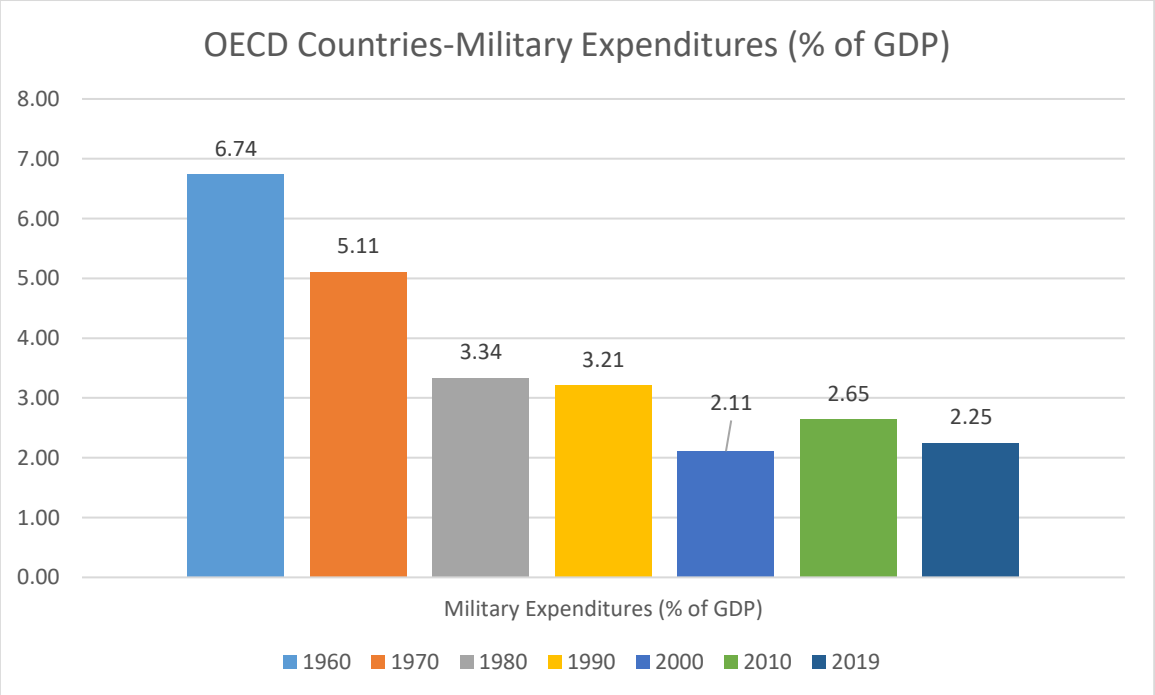
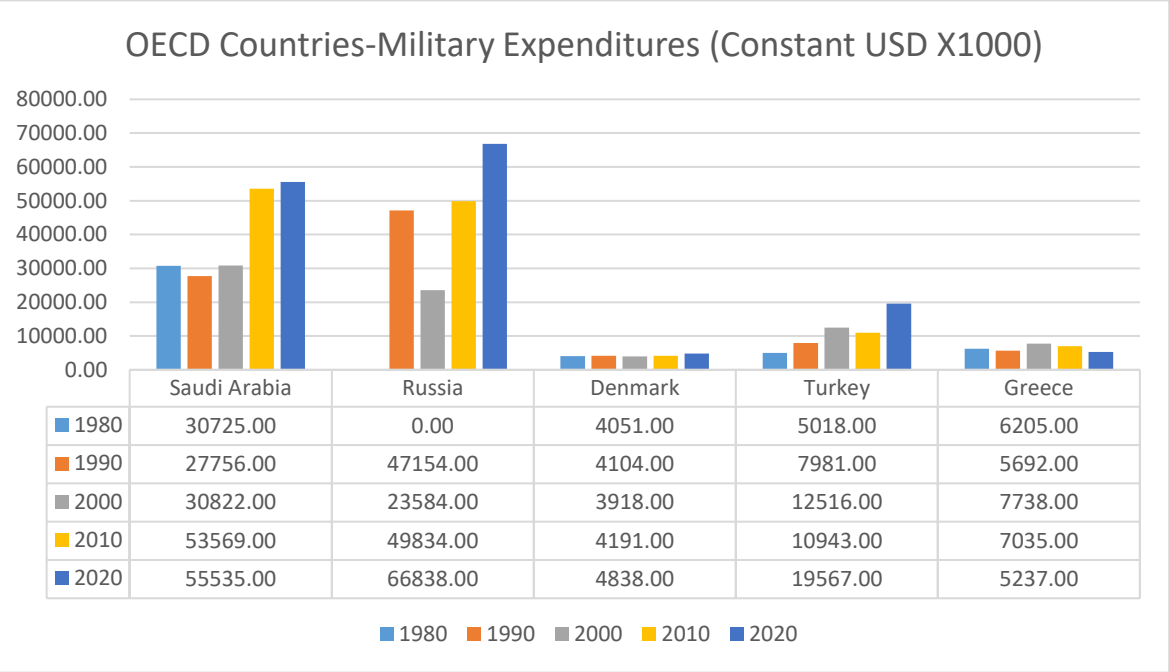


Figure 4: Military expenditures for OECD countries

Source: World Bank, 2021

When military spending of OECD Countries over the years is analyzed, although its share in GDP has decreased it can be seen that total military expenditure of OECD countries increased sharply from 1960 to 2000. Cold war, the oil crisis, the Gulf crisis, the Arab-Israel war, the invasion of Afghanistan and Iraq by the United States, terrorist attacks, and civil wars can be assessed as the main factors of this increase. In addition, although the economic crisis affected the level of military expenditures negatively in the first part of the 2000s, increased conflict environment which occurred after the trade wars and struggles for limited-valuable natural resources, caused the increase in military expenditures in the 2015s.



	Saudi Arabia	Russia	Denmark	Turkey	Greece
1980	30725.00	0.00	4051.00	5018.00	6205.00
1990	27756.00	47154.00	4104.00	7981.00	5692.00
2000	30822.00	23584.00	3918.00	12516.00	7738.00
2010	53569.00	49834.00	4191.00	10943.00	7035.00
2020	55535.00	66838.00	4838.00	19567.00	5237.00

Figure 5: Military expenditures for OECD countries

Source: Sipri, 2021

As we can see from the above figure which shows military expenditures of selected countries, an oil-rich country Saudi Arabia attracts attention. The country has no high technological defense industry infrastructure. Therefore, military expenditures of the country consist of import defense industry products and personnel salaries. Saudi Arabia is one of the biggest importers among the developed countries. Although most of the countries restricted their defense budgets because of the economic recession due to Covid-19 pandemic, Saudi Arabia still kept its huge defense budget. Russia which is one of the biggest

exporter of army products after USA have a big budget for defense. However, different from Saudi Arabia, its defense budget consists of investments for the defense industry. Denmark which is a rich country and which is far from regional conflicts have a low defense budget, only for payments of personnel salaries and maintaining the main duties of the army like border defense. The main reasons for Greece to maintain its defense budget on a certain amount are historical conflict with Turkey and a struggle to have a share from the East Mediterranean gas reserves. Even though it faced a deep economic crisis in the last five years and its economy shrunk approximately 10%, Greece government decided to increase the defense budget. And they increased their budget five times more than the 2020 defense budget which was approximately 540 million Euros (OECD, 2021).

According to the some economic indicators of OECD Countries that have military spending ratio above the average, it can be seen that all countries have different economic indicators from each other. While India which is among the five countries that have the highest spending on defense has the lowest GDP Per Capita, the USA has the highest rate. In addition, a developed country South Korea has the highest employment but a developing country Turkey has the lowest employment. On the other hand, India which struggles with deep economic problems due to its high population is the country that has the highest percent of the population living under the hunger limit. In addition, China is the most fast-growing country with its technological developments and its vision which direct the world trade market. Even though there are the effects of the pandemic and the country has high budget deficit, China government decided to increase its defense budget approximately 7% percent (OECD, 2021).

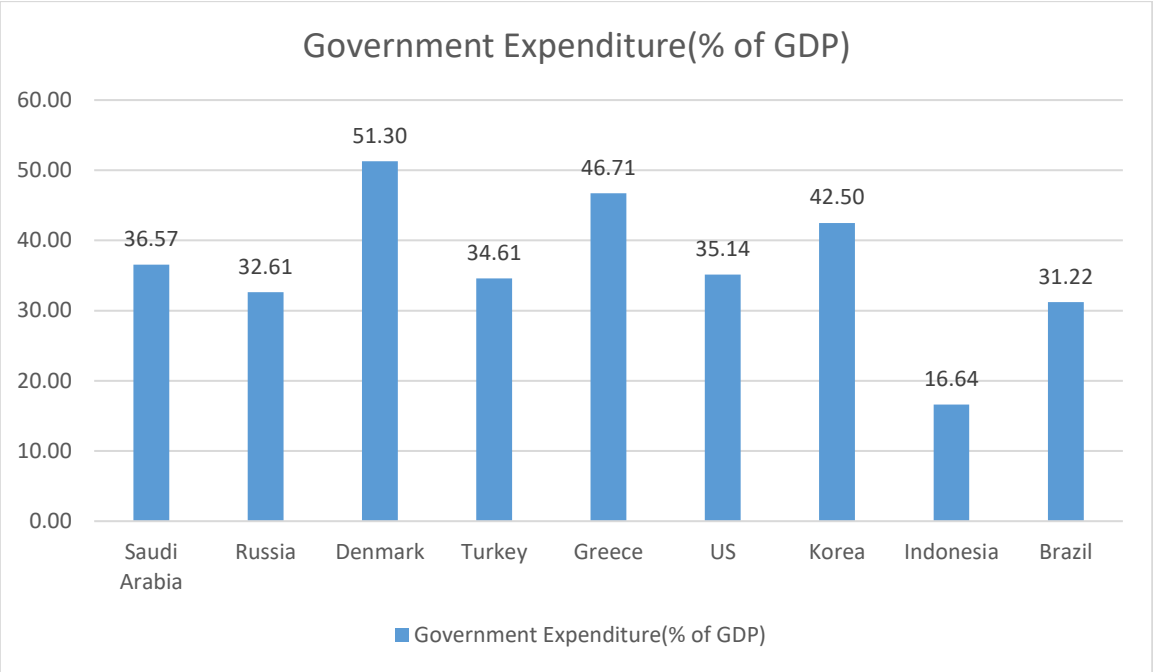


Figure 6: Government expenditures for selected countries

Source: IMF, 2019

As we can see from the above figure which shows all public spending of selected countries, Denmark has the highest government expenditure ratio. As a standard Nordic Country, Denmark government finance and provide welfare service, education policies, research incentive programs, and infrastructure service. Thus, these productive services and programs constitute most of the government expenditures of the country. Similarly, a developed country South Korea which passed from the middle-income trap very fast spend most of its government expenditure for incentive policies, education, and infrastructure. On the other hand, defense and health expenditures consist most of the budget of Saudi Arabia which use its oil wealth for arms agreements, health sector and urbanization policy (ticaret.gov.tr, 2019). In addition, Brazil which uses approximately 31% of its GDP for government expenditures, draws attention with its high ratio income injustice. Also, unproductive arms contracts have an important role in high ratio government spending. Indonesian public spending which started to contract rapidly with the Great Asian Crisis at the end of the 1990s, was used for development policies after getting over the effects of the crisis. The adoption of a free-market economy, high population, and foreign dependency in energy are key factors in reducing productive public spending (ticaret.gov.tr, 2019).

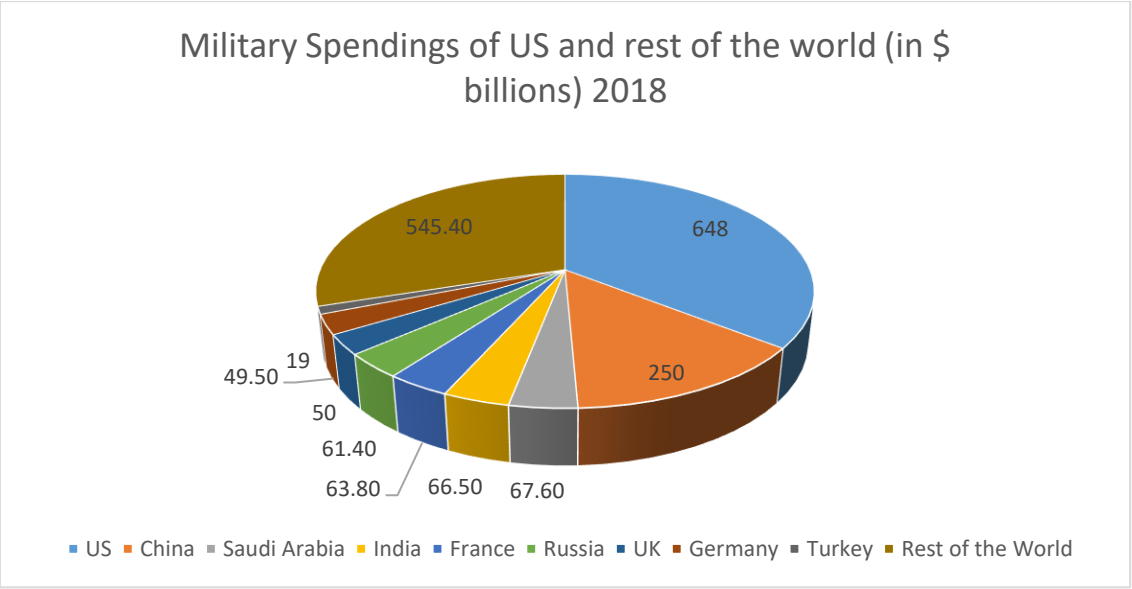


Figure 7: Military Expenditure of US and rest of the world

Source: Sipri, 2020

When compared with the rest of the countries, the US military expenditures consist of more than 35% of all world military expenditures. The fact that 7 of the 10 largest defense industry companies in the world have American origin proves this situation. These companies have made many countries dependent on US with their high military technology and this has increased the export potential of the country (Sipri, 2020).

According to a study conducted by Fortune (2015), although wars and conflicts affect economies negatively, this situation is not valid for US economy. Since US GDP increased after every war and conflict, it can be seen that wars and conflicts affect US economy positively.

The country, which achieved a GDP average of approximately 13 % during the First World War, completed the Second World War by achieving an average growth rate of approximately 11 %. Continuing its growth statistics in the Korean and Vietnam wars, the country's economy experienced the main development during the Iran-Iraq (1987-88) and Gulf Wars (1990-91). On the other hand, the Afghan war that lasted for about 11 years and the Iraq war that continued for many years contributed to the rapid growth of the country's economy. Except for the period of global economic recession in 2008-09, the American economy grew rapidly despite all wars and conflicts. The reasons why the US economy is

positively affected by wars, despite its negative effects on all world economies, can be listed as follows;

a. These wars were not in the US borders,
b. None of the US infrastructure and production institutions damaged,
c. US defense companies procured all plane, tank, and all other military products for the parties,
d. US defense industry employs approximately 5 million Americans,
e. Since the US defense industry and energy-technology sectors are related, it affects these sectors positively (Fortune, 2015).

2.4. Public Defense Expenditures in Turkey

Defense budget need is very important for Turkey. The country is a bridge between Europe and Asia, and strategically located in conflicted region where there are energy resource, problems ongoing conflict and tensions with terrorist organizations.

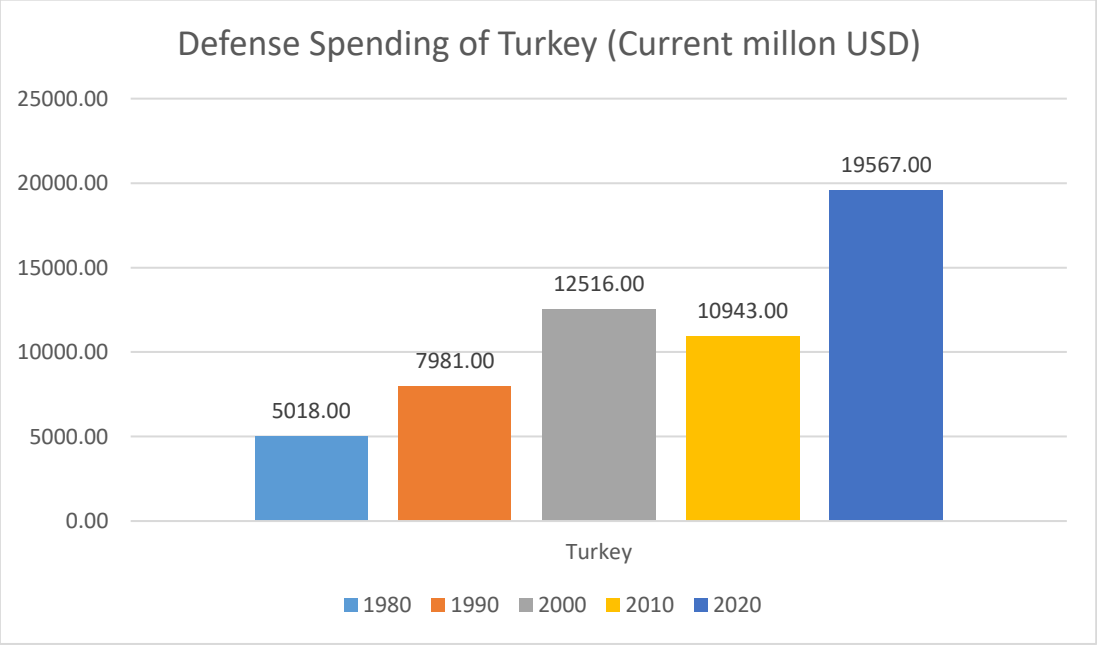


Figure 8: Military Expenditure of Turkey

Source: Sipri, 2018

Turkey uses a significant portion of its GDP for military purposes to compete with all these threats, to obtain rights from energy corridors around the country, and in order to make the country attractive for investors. In addition, having the region's largest and technically rapidly developing army cause to increase in this budget (Sipri, 2018).

In this section where public defense expenditures are evaluated, the budgets of the land forces, air forces, and naval forces are specified under the heading of the Ministry of National Defense. After evaluating the budgets of the Gendarmerie General Command, the Coast Guard Command, and the Turkish Police, information on the budgets of the Defense Industry Presidency and the TUBİTAK, which indirectly contributes to the defense industry, is presented. Then the locomotive of the Turkish defense industry Turkish Armed Forces Foundation and its affiliates are presented with their projects and budgets. Finally, information about the general situation of the Turkish defense industry, its projects, and its position in the world defense industry sector is presented.

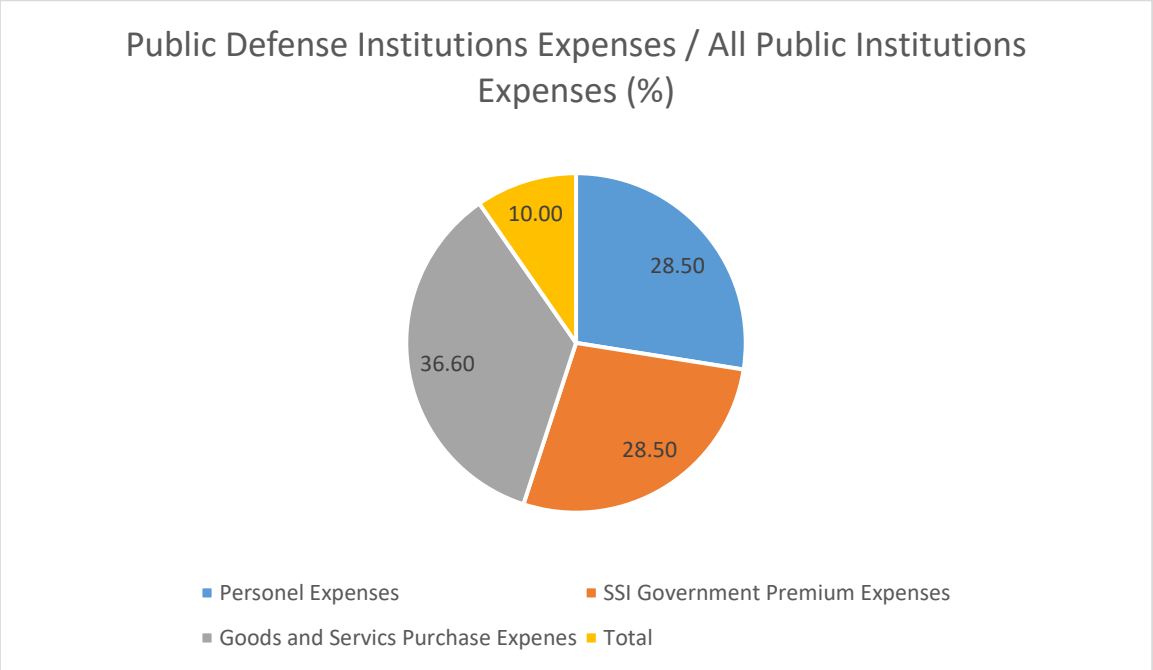


Figure 9: Public Defense Institutions Expenses

Source: Central Government Budget, 2020

According to the figure which shows all spending of the central government, military and indirect military institutions personnel expenses consist of approximately 28% of all

personnel expenses. In addition, spending for military goods and service draw attention. Approximately 36% of all goods and service spending are used for military purposes. Since institutions related to defense use tight budgets for transfers, lending, and reserve funds most of the budget of these institutions consist of salaries, maintaining and purchase cost of military arms, products, and services. Although the high rates of the military in the personnel expenses, SSI Government Premium Expenses and Goods and Services expenses, only 10% of the all government budget was used for institutions related to defense.

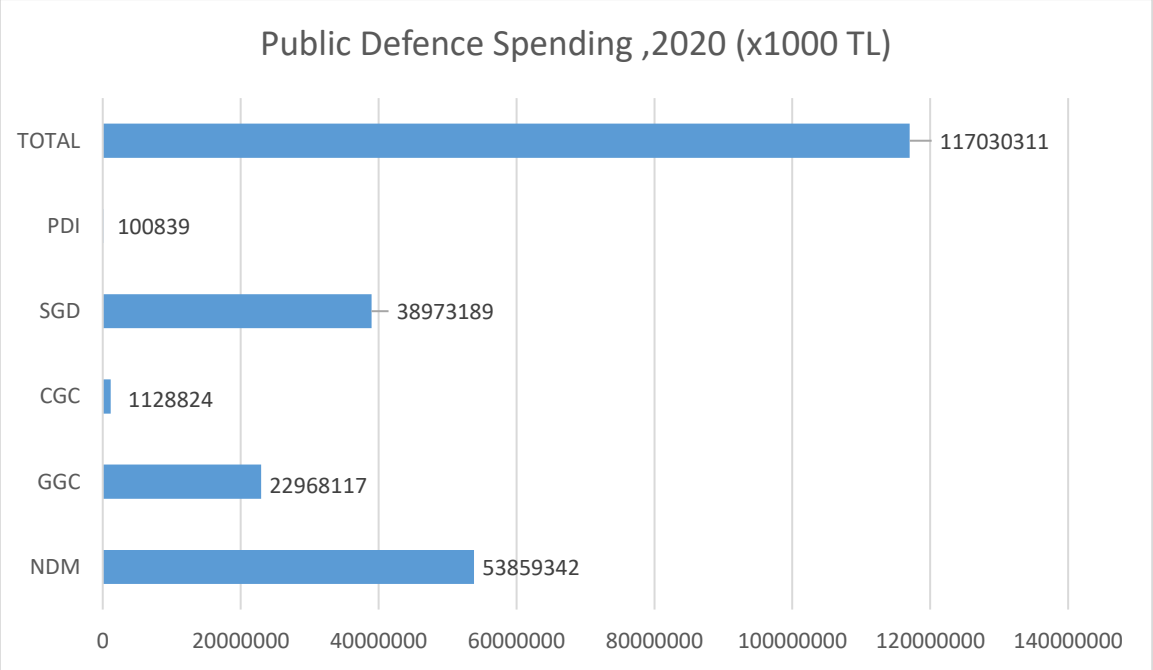


Figure 10: Public Defense Spending

Source: Central Government Budget Law, 2020

Symbols:

NDM National Defense Ministry

GGC Turkish Gendarmerie Command

CGC Turkish Coast Guard

SGD Turkish Police Service

PDI Presidency of Defense Industry

National Defense Ministry uses approximately 46% of the public defense budget. National Defense Ministry Budget consists of land forces, air forces, and naval forces budgets. In addition, the Turkish Police Service budget is considered under the defense budget because of its special operation teams as used to support the army operations. In addition, the duties it took in peacekeeping operations abroad, the duties he carried out within the scope of the fight against terrorism, and the special operations carried out by the special operations units cause the police expenditures to be listed below the defense expenditures. Thus, the Turkish Police Service is the second with its budget after National Defense Ministry. They are followed by the budgets of the Gendarmerie General Command and the Coast Guard Command, which are separated from the Ministry of National Defense and subordinate to the Ministry of Interior in 2016 (Central Government Budget Law, 2020).

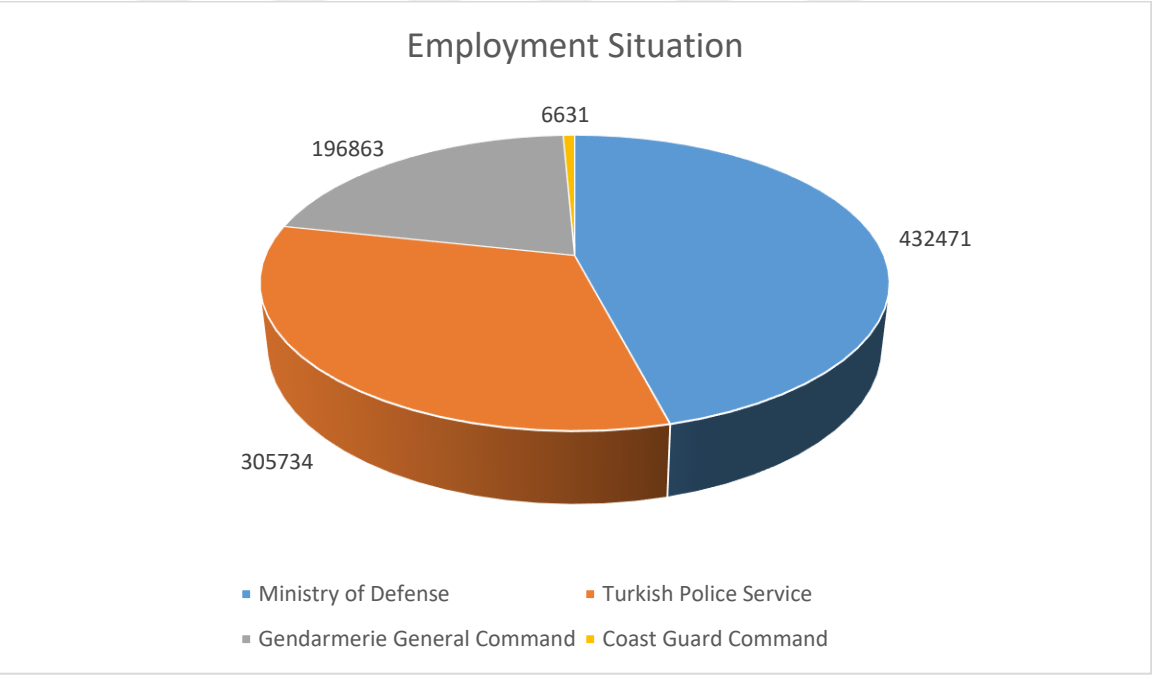


Figure 11: Employment in Public Defense Institutions

Source: Turkish Court of Accounts Audit Report, 2019

The Turkish Public Defense Sector offers job opportunities to more than one million people. When we add the employment of the Turkish Armed Forces Support Foundation and its affiliates to this, it can be clearly seen that public defense expenditures have a positive effect on unemployment. While 46% of the employees in the Turkish public sector are

employed by the Ministry of National Defense, followed by the Turkish Police Department with 32% (Turkish Court of Accounts Audit Report, 2019).

2.4.1. Turkish Defense Ministry

The majority of the public military expenditure is met from the budget of the National Defense Ministry in Turkey. National Defense Ministry consists of the directorates of the central organization, the chief of general staff, force commands, and related organizations.

The main objectives of the Turkish Defense Ministry;

- To complete the modernization projects of the Turkish Armed Forces,
- To supply weapons and all kinds of ammunition,
- To complete personnel and all kinds of logistics needs in a timely and appropriate manner,
- To conduct bilateral meetings in the international arena and
- To provide the map and geographic data support.

The main goal set by the ministry to achieve the main objectives listed above and execute all kinds of financial, legal, political, and social processes in line with the country's defense policy. Personnel recruitment, logistics activities, warfare industry services (including military factories and shipyards) are evaluated within this scope. While defining the basic principles and objectives, the National Defense Ministry acts within the framework of the country's defense policy (Ministry of Defense Activity Report, 2019).

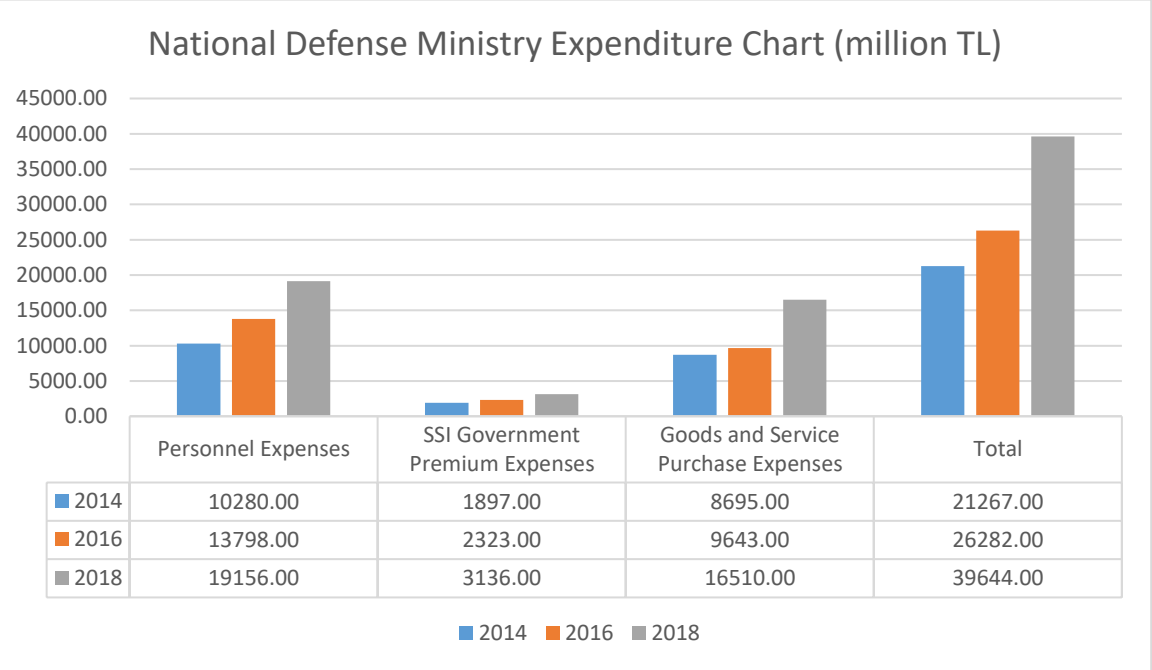
The global security environment has lost its predictability in today's world. In addition, risks and threats have started to emerge with an international and multi-faceted structure. In this sense, Turkey's defense policy built on terrorism, climate change, internal instabilities, weapons of mass destruction, energy security, sea rogue, virtual attacks, environmental problems, radical currents, organized crime, migration, and smuggling (Ministry of Defense Activity Report, 2019).

With the principle of creating a strong and modern army, the ministry increases the competitiveness of the Turkish Armed Forces with its projects on the defense industry and information systems. On the other hand, Turkey supports the NATO organization activities by participating actively.

Some important projects carried out within the Ministry of National Defense are as follows;

a. New type of Storm howitzer
b. TSK Satellite Communication System Project (TUMSİS),
c. TSK Mobile Phone Project (TSK-CEP),
d. TAFICS Modernization Project,
e. TSK Encrypted Satellite Phone (TSK K-UT) Project,
f. TSK Smart Card and e-Signature System. (Ministry of Defense Activity Report, 2019)

The Ministry of National Defense has many ongoing projects within the scope of modernization of the Turkish Armed Forces. While some of these are projects related to space and communication, some of them are projects related to the improvement of weapons and ammunition systems (Ministry of Defense Activity Report, 2019).



	Personnel Expenses	SSI Government Premium Expenses	Goods and Service Purchase Expenses	Total
2014	10280.00	1897.00	8695.00	21267.00
2016	13798.00	2323.00	9643.00	26282.00
2018	19156.00	3136.00	16510.00	39644.00

Figure 12: National Defense Ministry Expenditure Chart

Source: Ministry of Defense Activity Report, 2018

The Ministry's 2018 expenditures increased by 86.4% compared to 2014 Expenditures. When compared to 2014, Government Premium Expenditures to Social Security Institutions

65.3%, Expenditures for Goods and Services Purchase Expenditures 89.9%, Current Transfer Spending 106.1%, Capital Spending Expenditures 102.6%, and Capital Transfer Expenditures increased by 160.6% (Ministry of Defense Activity Report, 2018).

2.4.2. Gendarmerie General Command

Gendarmerie is the law enforcement authority authorized to take all security measures specified in the Gendarmerie Organization, Duties and Powers Law in order to ensure safety and security and to keep the public order. In this context, the duties of the Gendarmerie are classified under three main headings:

a. territorial,

b. military,

c. judicial duties.

Public order (safety and security), external protection of smuggling and penal execution institutions constitute territorial (civil) duties. Apart from these, judicial services related to crimes constitute judicial duties. Finally, military services provided by the relevant laws constitute military duties.

The duties and responsibilities of the Turkish Gendarmerie which is affiliated with the Internal Affairs Ministry are outside the police duty area (outside the city and district municipality boundaries). On the other hand, with the approval of the Minister of the Interior, an entire province or district can be designated as a police or gendarme duty and responsibility area (Gendarmerie General Command Activity Report, 2019).

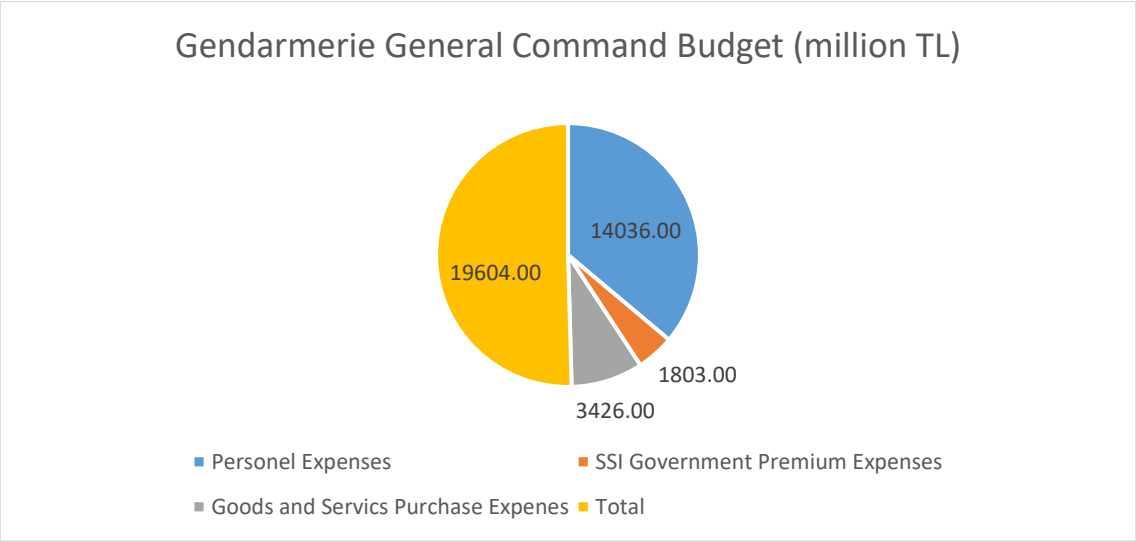


Figure 13: Gendarmerie General Command Budget

Source: Gendarmerie General Command Activity Report, 2019

The 2019 Central Government Budget Law allocated 19 604 133 000 TL budget to the Gendarmerie General Command. With the appropriation added and deducted during the year, it reached 21 115 934 383 TL. When the Gendarmerie General Command 2019 budget is examined:

71.60% of the budget is allocated for personnel expenditures (Personnel salaries, worker wages, additional work provisions, additional course fees, operational compensation, awards and bonuses, private and student allowances, international salaries),

9.20% of the budget is allocated for state premium to Social Security Institutions (SGK),

17.48% of the budget is allocated to purchases of goods and services (Purchases of goods and supplies for consumption, sprues, duty expenses, service purchases, representation and promotion costs, securities, intangible rights purchase, maintenance and repair costs, real estate goods maintenance and repair expenses, treatment and funeral expenses),

0.03% of the budget is reserved for current transfer (Allowances to be paid to guest military personnel and health premium payments, free treatment of expert soldiers and soldiers who have been wounded and terminated during their military service, membership fees paid under international projects),

1.69 % of the budget is allocated for capital (vehicle purchase, land, and land expropriation, building strengthening projects, union building, and lodging construction, maintenance repairs, expenses of bringing drinking water to the police stations, office furnishings purchases) (Gendarmerie General Command Activity Report, 2019).

2.4.3. Coast Guard Command

The Coast Guard Command acts as required in the Coast Guard Command Law, Police Duty and Authority Act, and Criminal Procedure Law during the performance of its civil and judicial duties. The Coast Guard Command has the powers and responsibilities of the gendarmerie and police while performing these responsible areas. The responsibility area of the Coast Guard Command is:

- The whole coast of the Republic of Turkey,
- Marmara Sea, Istanbul and Çanakkale Bosporus,
- Ports and gulfs,
- Land waters,
- The marine areas and international waters under its sovereignty and control (In accordance with the Exclusive Economic Zone and national and international rules of law)

The duties of the Coast Guard Command are gathered under three main headings:

a. "Civil Duties",
b. "Judicial Duties"

c. "Military Duties" (Coast Guard Command Activity Report, 2019).

Judicial duties involve performing the procedures specified in the legislation on the criminal procedure regarding the crimes committed and performing the judicial services related to them. Military missions; refers to the duties that the Coast Guard Command will carry out under the command of the Navy in the case of mobilization and war, with the decision of the President. On the other hand, to ensure public order, to fight against smuggling, to take precautions to protect sensitive and critical facilities, to take and implement necessary measures to prevent crime are civil duties (Coast Guard Command Activity Report, 2019).

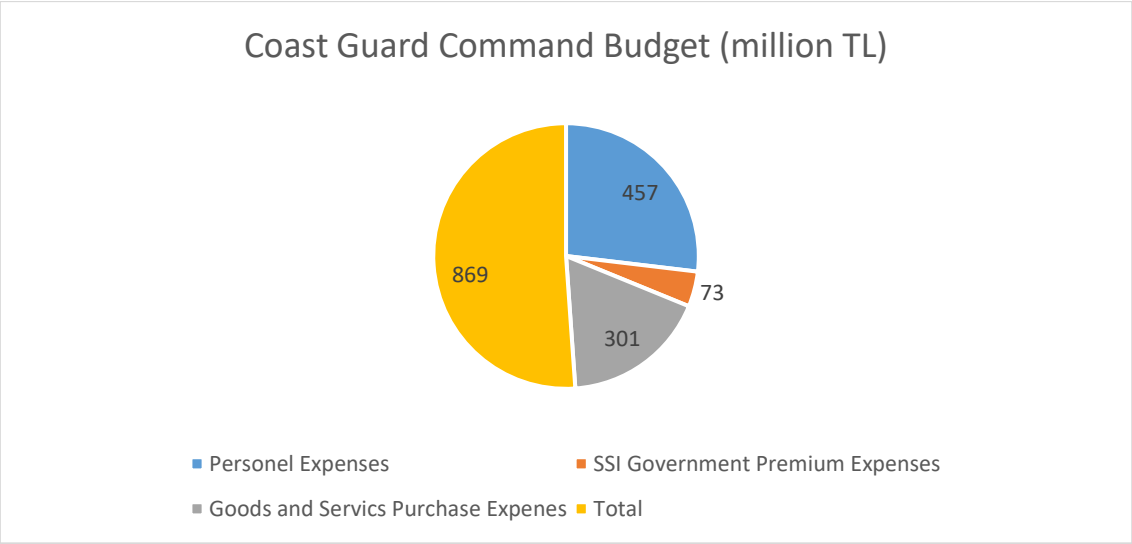


Figure 14: Coast Guard Command Budget

Source: Coast Guard Command Activity Report, 2019

Approximately 52% of the Coast Guard Command's budget consists of personnel expenditures, 35% goods and services purchases, 9% social security expenses, and the remaining transfer expenditures (Coast Guard Command Activity Report, 2019).

2.4.4. Turkish Police Service

The general police duties of the Turkish Police Service established on April 10 1845 are divided into two parts;

a. Taking precautions before the actions that are not in compliance with laws, regulations, and public order,

b. To perform written duties in a Criminal Procedure Code and other laws about a crime that has been committed.

As stated in the text of the law, the police have two basic duties: judicial and administrative. The judicial duties of the police begin with the committing of the crime. It is the police's judicial duty to carry out the investigation on behalf of the public prosecutors and to deliver suspicious persons and evidence of a crime to the judicial authorities. The administrative duties of the police are to ensure the safety of people and property by ensuring the general order and public order (Turkish Police Service Activity Report, 2017).

However, the police force plays an important role in the fight against terrorism in our country. It carries out joint operations with police special operations units, Turkish Armed Forces, Gendarmerie General Command units and intelligence elements. In addition, the Turkish police force is actively used in cross-border operations for the purpose of combating terrorism. They also take part in NATO and UN units within the scope of peacekeeping operations. In addition, since they engage in activities to combat criminal organizations, smuggling, and immigration they have a crucial role as an element of the defense policies of the countries (Defense Ministry Activity Report, 2019).

Approximately 323 842 personnel work in the Turkish Police Service. 6.6% of the personnel working in the Turkish Police Service are Police Supervisors, 86.4% are Police Officers and 7% are Market and Neighborhood Keepers (Turkish Police Service Activity Report, 2019).

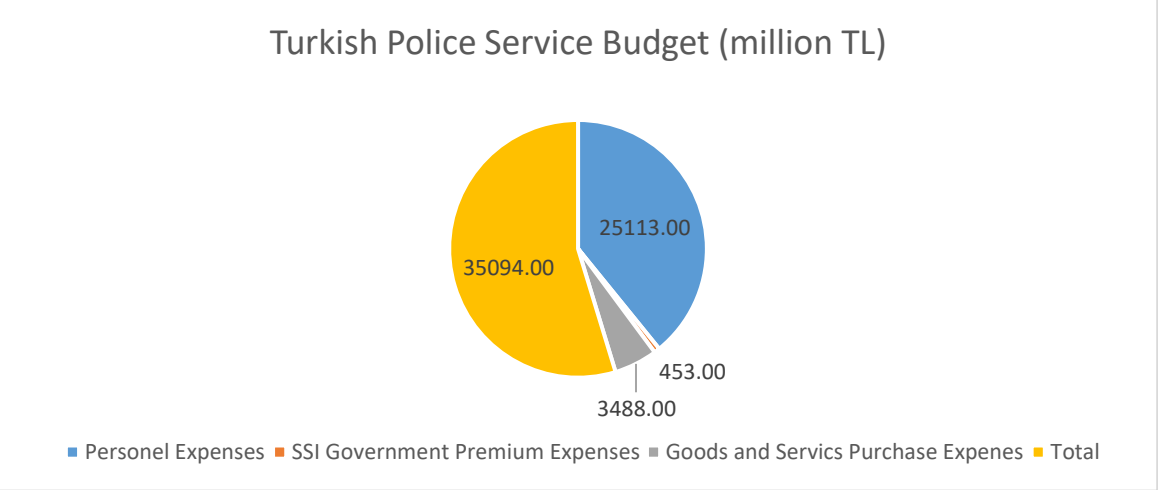


Figure 15: Turkish Police Service Budget

Source: Turkish Police Service Activity Report, 2019

With the Central Government Budget Law, 33 676 247 000 TL allowance has been allocated to the Turkish Police Service. This amount has increased to 35 094 228 391. 15 TL with the increase in the year (Turkish Police Service Activity Report, 2019).

2.4.5. Turkish Defense Industry Presidency

The main mission of the Turkish Defense Industry Presidency, which sets out with the goal of making the Turkish defense industry a global force, is to lead the national industry

to achieve the capacity to meet the defense and security needs of the country in the most effective way. In this sense, these are the core values to rebuild Turkey with global power target:

• To be Proactive,

• Holistic View,

• Cooperation and Coordination,

• Accountability (Defense Industry Presidency Activity Report, 2019).

The Defense Industry Presidency is a special budget institution affiliated with the President and has a legal personality. In addition to the purpose of developing the modern defense industry, an efficient and flexible system has been established to ensure the rapid supply of the needs of the Turkish Army and other security forces. The basic mechanisms of this system are;

a. Executive Committee of the Presidency,
b. Support Fund (Defense Industry Presidency Activity Report, 2019).

Defense Industry Targets		
	2018	**2023**
Defense and Aviation Industry Turnover (Billion Dollars)	6.70	26.90
Defense and Aviation Industry Export (Billion Dollars)	2.00	10.20
Defense and Aviation Industry Employment (Thousand People)	44.70	79.30
Defense Industry Locality (%)	65.00	75.00

Table 2: Targets of Defense Industry

Source: Presidency of Defense Industry Activity Report, 2019

Defense Industry Support Fund was established in Central Bank at the command of the presidency for the modernization of the Turkish Armed Forces and establishment of the

modern defense industry in Turkey. Defense Industry Support Fund resources are used to modernize the Turkish Armed Forces, meet the intelligence and security needs of the Turkish National Police, Gendarmerie General Command, the Coast Guard Command and improve the defense industry. Although the financing of the projects carried out under the responsibility of the Defense Industry Directorate is aimed mainly from the Defense Industry Support Fund, there is also the possibility of obtaining state-sponsored loans from abroad for projects that require a large amount of financing. On the other hand; apart from the army, the Defense Industry Directorate can also supply the needs of the public institutions and organizations within the field of activity of the Presidency (Defense Industry Presidency Activity Report, 2019).

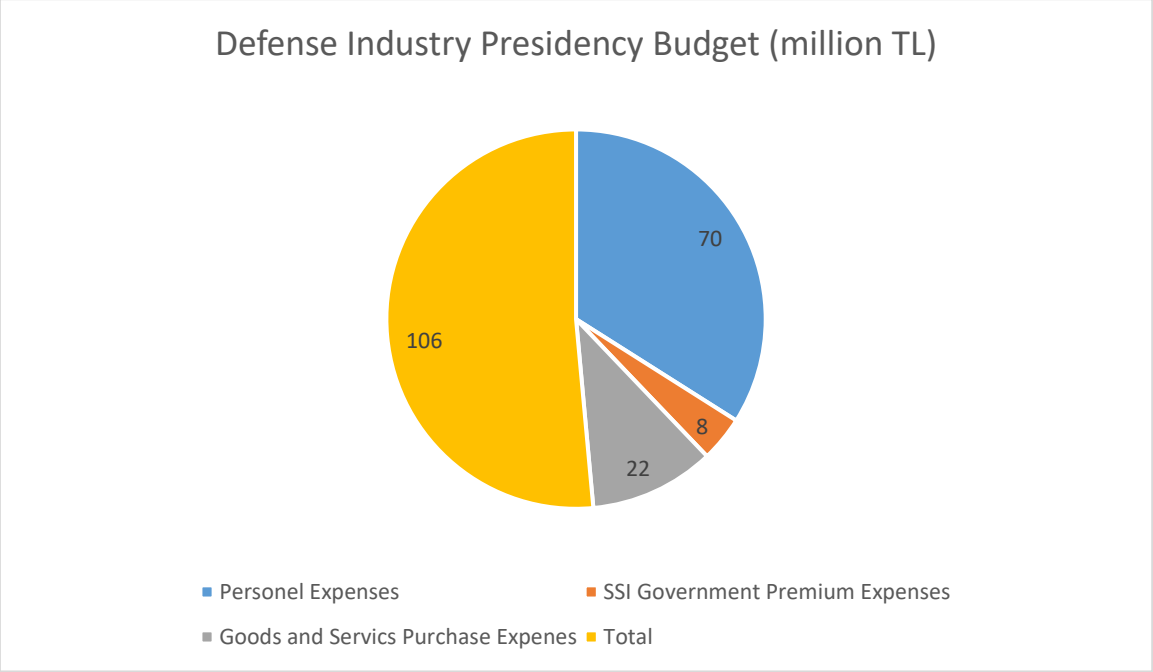


Figure 16: Defense Industry Presidency Budget

Source: Presidency of Defense Industry Activity Report, 2019

Approximately 62% of the Presidency of Defense Industry budget consists of personnel expenditures, 20% goods and services purchases, 8% social security expenses, and the remaining transfer expenditures.

2.5. Turkey Scientific and Technological Research Institution

Turkey Scientific and Technological Research Institution has been established to increase Turkey's competitiveness, to develop science and sustainable technology policies, to encourage research and development activities, to support science and to pioneer the development of technology culture. The institution, one of the "affiliated" institutions of the Science, Industry and Technology Ministry, has "legal personality, administrative and financial autonomy". The main duties of the institution are as follows;

• Supporting, coordinating, monitoring, encouraging and doing research and development activities in scientific and technological fields; to develop programs and projects for this purpose;

• To establish research centers and institutes in order to strengthen the technology infrastructure, and to conduct research in strategic areas aimed at increasing the competitiveness of our country based on science and technology, invention and innovation, economic and social development, national security, human and environmental health;

• To lead in the development of science and technology culture throughout our country;

• It has the power to provide capital support and grant prepayments, to carry out all kinds of activities, and to provide the necessary support, without guarantee, in line with the statute to be designed by the Scientific Committee (Turkey Scientific and Technological Research Institution Activity Report, 2019).

As of 2019, the number of different customers provided with R&D Service was 12. Important activities realized in the projects are listed below:

Some Defense Projects	
Project / Activity Area	**Detail**
SOM	It is a guided cruise missile capable of operating in all weather conditions, developed against fixed or moving sea, air

	and ground targets, with high strike power, long range and operational flexibility.
KEMENT	National smart arms and cruise controls
GÖKTUĞ	Two new missile systems, which can be fired from F16 aircraft, have a short-range high maneuverability, Infrared Imager-Headed In-Missile Missile and Active Radar Seeker-Headed Vision Missile.
OPMER	With the Optical Systems Research Laboratory being established within the space, it is aimed to develop the sensitive optical components (mirrors, lenses, filters etc.) in the imaging systems with national possibilities.
BALİSTİKA	With the Unit and Super Speed Computer Cluster developed within the scope of the Ballistic Trace Inspection and Analysis System Development and Dissemination Project, the hive and bullet core comparisons can be performed in a computer environment in 3D and very fast with the super speed computer cluster.

Table 3: Some Ongoing Defense Projects

Source: Turkey Scientific and Technological Research Institution Activity Report, 2019

Forty-three projects are currently being carried out at the Defense Industry Research and Development Institute. Eight of them for the Ministry of Development, 5 them for the Turkey Research Area. In addition, thirty of them belong to the Defense Industry Department and other defense organizations. The total amount of the projects carried out is 2.151 Million TL are shared like these;

a. Externally supported projects: 1771 Million TL,
b. Development Projects: 296 Million TL,
c. TARAL Projects: 84 Million TL (Turkey Scientific and Technological Research Institution Activity Report, 2019).

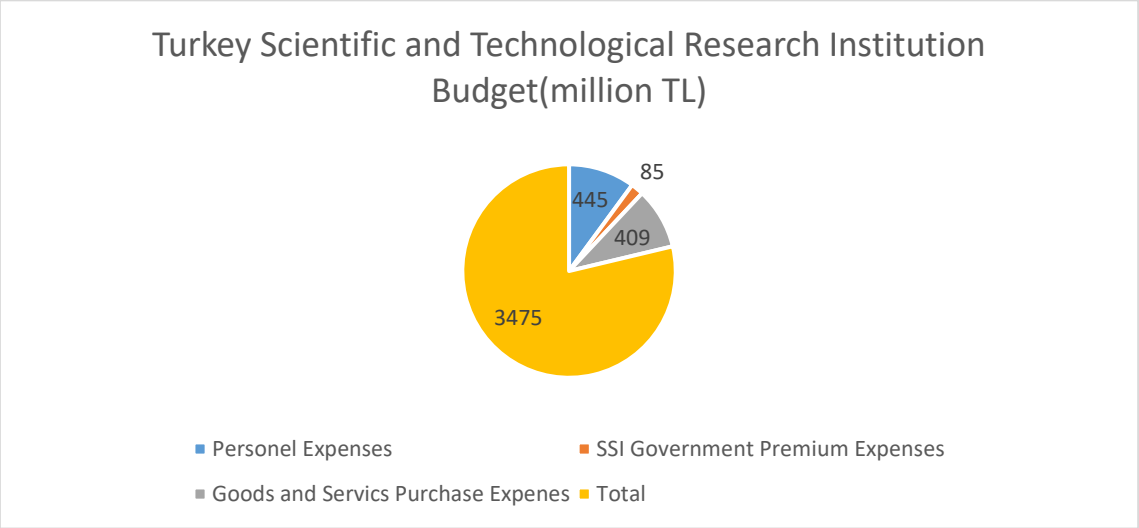


Figure 17: Tubitak Budget

Source: Turkey Scientific and Technological Research Institution Activity Report, 2017

Science, Industry and Technology Ministry has allocated 2 918 128 050.00 TL appropriation to the Turkey Scientific and Technological Research Institution with Central Government Budget Law. This amount constitutes approximately seventy-five percent of all revenues of the institution. On the other hand, the remaining twenty-five percent of the institution's budget revenues consist of its own revenues (Tubitak Activity Report, 2019).

2.6. A Foundation Working for Public Benefits: Turkish Armed Forces Strengthening Foundation

Turkey could not use some defense materials, which were imported from allied countries, due to the embargo during the Cyprus problem which began in the 1960s. This situation has revealed the importance of meeting the defense needs with domestic opportunities and has formed the basis of policies for the establishment of a self-sufficient defense industry infrastructure (https://www.tskgv.org.tr, 2020).

The "Turkish Naval Society", which was founded in 1965, has launched the "Make Your Own Ship" campaign. In addition, the "Air Force Foundation" was founded in 1970 to improve our national aviation infrastructure. After the 1974 Cyprus Peace Operation, Turkey confronted with the arms embargo. However, the first steps of the modern national defense industry were taken in this period in order to reduce the negative effects of this situation. In the same year, the "Turkish Land Forces Foundation" was established. The great enthusiasm in the public led our people to donate to the Land, Naval, and Air Force Strengthening Foundations at that time (https://www.tskgv.org.tr, 2020).

Turkish Plane Industry Joint Stock Company (TUSAŞ) was established depending on the Turkish Industry and Technology Ministry in order to decrease Turkey's defense industry dependence on external sources in 1973. Later, companies such as ASELSAN (1975), İŞBİRSAN (1978), ASPİLSAN (1981), and HAVELSAN (1982) were established and huge investments were made in the defense industry (https://www.tskgv.org.tr, 2020).

The foundations which were established with the donations of our nation to develop the defense systems and products of the Turkish Armed Forces were merged as the Turkish Armed Forces Foundation on 17 June 1987. Since its establishment, the Turkish Armed Forces Strengthening Foundation has made strategic investments in the field of the national defense industry. The foundation has established both domestic and international companies which have crucial positions in the world market (https://www.tskgv.org.tr, 2020).

Companies affiliated with the Turkish Armed Forces Foundation	
Company	**Detail**
Aselsan	electronics industry
Tusaş	aviation, satellite and space industry
Roketsan	rocket and missile industry
Havelsan	software and information industry
İşbir	generator and alternator industry
Aspilsan	battery industry

Table 4: Turkish Armed Forces Foundation Companies

Source: https://www.tskgv.org.tr, 2020

Some organizations have been established under the foundation in order to strengthen the Turkish defense industry. In this context, Aselsan in the field of the electronics industry, TAI in the aerospace industry, ROKETSAN in the rocket-missile industry, HAVELSAN in the software and aviation field, İŞBİRSAN in the field of generators, and ASPİLSAN in the field of batteries were established.

2.6.1. Aselsan

Aselsan, Turkey's leading company in the defense industry was established in 1975. The company was established to strengthen the communication infrastructure of the Turkish Army. The vision of the company is fulfilling its main purpose in its establishment and to become a human-sensitive technology company with sustainable growth and competitive power in the global market.

Aselsan provides innovative technology to the defense industry and contributes to the economic development of the country in the field of employment. Approximately 8,279 qualified personnel are currently working in Aselsan (Aselsan Activity Report, 2019).

ASELSAN PARTNERSHIP STRUCTURE		
Shareholders	**Share Amount**	**Share Ratio**
TAFSF	845 million	75
Public Offering	295 million	25
Total	1.140 million	100,00

Table 5: Aselsan Partnership Structure Chart

Source: Aselsan Activity Report, 2019

After the public offering, approximately 25% of ASELSAN's shares are traded on the stock exchange, and the remaining shares belong to the Turkish Armed Forces Foundation.

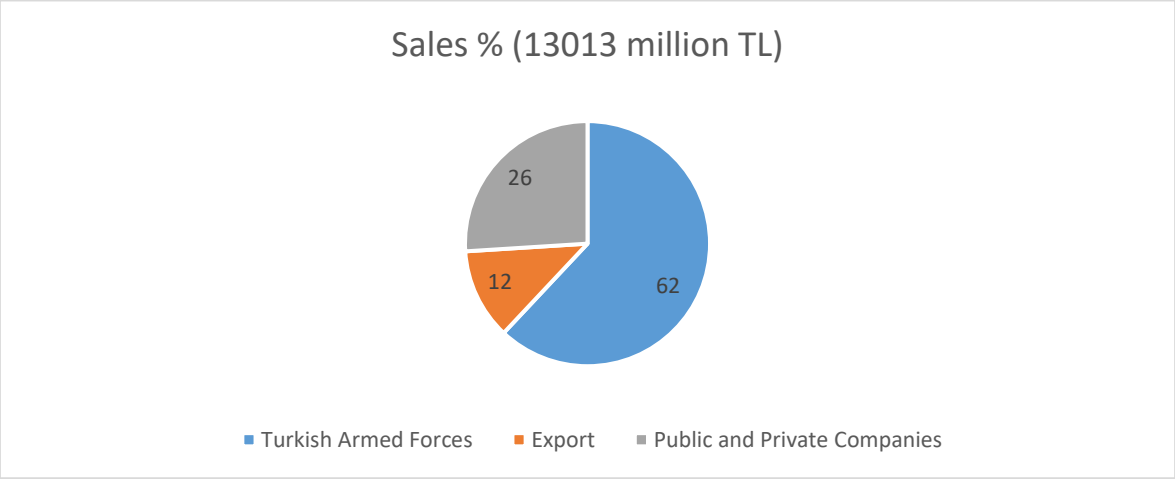


Figure 18: Aselsan Sales

Source: Aselsan Activity Report, 2019

Aselsan realized 62% of the sales to the Turkish armed forces. They realized twenty-six of the sales to particular organizations and other corporate customers. In addition, they realized 12 % of the sales as export. On the other hand, new orders are signed as 3 billion 43 million USD as of 2019. The order amount of Aselsan for the future is $ 9.7 billion. According to the financial reports of 2020, Aselsan reached the highest profit in all times with 1.8 billion TL in the first semi-year of 2020. In addition, endorsement of the company occurred as 5.2 billion TL by catching a 13% growth rate (Aselsan.com.tr, 2020).

ASELSAN, which try to succeed in eliminating the negative effects of the Covid-19 epidemic by continuing its activities keen, managed to receive a new order of approximately $ 510 million in 2020. ASELSAN's total balance orders were realized 9.5 Billion Dollars and 94% of these balance orders were defensive and 6% non-defense orders. Since the beginning of 2020, approximately 7 Billion TL has been paid to the supplier companies. In April 2020, as an indication of the uninterrupted continuity of activities, the "Our Power Is One" platform was launched for ASELSAN's suppliers. With this platform, activities such as bidding, quality, product supply, training, inspection processes, supplier scorecards, and announcements could be carried out without interruption (Aselsan.com.tr, 2020).

On the other hand, Aselsan, in accordance with the national technology acquisition targets, which is the foundation strategy of the company, increases its R&D capability every

year in order to decrease the external dependency of our country in the military industry and to meet the needs with national technologies. Also, it improves itself to develop innovative, and high technology products. ASELSAN continues to work in many fields of activity such as energy, shipping, health, and senior communication, as well as its main field of defense technologies with its innovations. Thus, R&D expenditures in 2018 were realized as 2163 million TL and 2019 R&D expenditures as 2975 million TL (Aselsan Activity Report, 2019).

Aselsan which was founded to empower the electronic infrastructure of the Turkish Army runs in various activity areas. We can split these activity areas of Aselsan into 5 main groups. These are;

a. Communication-Information,

b. Defense System Technologies,

c. Microelectronic-Electro Optic,

d. Radar,

e. Shipping, Safety, Energy, Automation and Health Systems (Aselsan Activity Report, 2019).

Aselsan which has an established goal of catching a position in the first 50 defense industry companies list in the world, attended to the Defense Companies Top 100 list in 2008 from 97th row and continued its progress consistently. From this point of goal, Aselsan got a position in the list as of 55th row in 2019 and just after progressed to 48th row in 2020. (Aselsan Activity Report, 2019).

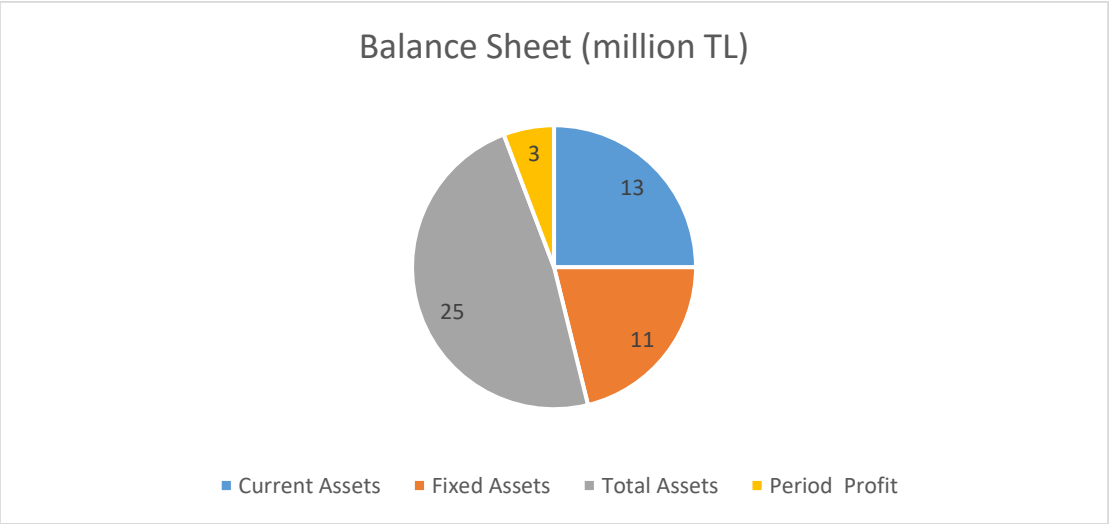


Figure 19: Aselsan Balance Sheet (Million TL)

Source: Aselsan Activity Report, 2019

2.6.2. Havelsan

Havelsan was founded in 1982 to develop innovative systems in the fields of defense, security, information, and energy. Also, it started its activities with 100 % national capital in 1985. The company develops critical safety systems for the military and civil sector at home and abroad. In this context, high-value-added projects are carried out in the fields of communication, intelligence, reconnaissance, surveillance, cybersecurity, simulator, and air defense systems. The main objectives of the company which set off with the mission of developing innovative (high productive and cost-effective) solutions and leading the technological transmission to reach onward technologies are as follows;

a. To be a pioneer in the meeting of strategic needs based on software-intensive technology with innovative local solutions and to make the maximum support,
b. Being a consulting firm in technology development phases as a strategic adviser,
c. To be a leading company that develops software at all strategic points around the world,

d. To be a company that develops innovation, increases efficiency, and pursues competition (Havelsan Activity Report, 2019).

Havelsan which was founded to empower the air electronic infrastructure of the Turkish Army runs in various activity areas. We can split these activity areas of Havelsan into 3 main groups. These are;

a. Land Projects,
b. Marine Projects,
c. Air Projects (Havelsan Activity Report, 2019).

2.6.3. Roketsan

Roketsan was founded with the goal of procuring the rocket-missile needs of the Turkish Army in 1988. Having a pioneer foundation regarding rocket-missile design and the development of high technology products are the main goals of the company. Roketsan has succeeded in converting the transferred technologies into new products. Using right strategies to realize its establishment purpose, it caused to bring trained labor to our country (Roketsan Activity Report, 2019).

It created a national industry specializing in rocket/missile. In addition, Stinger Project caused to get many advanced technologies, infrastructure, and experience that our country needs. Roketsan started a "design" period with the completion of the missile design infrastructure development project launched in 1992 (Roketsan Activity Report, 2019).

In addition, the production chain was reorganized for the realization of projects launched by the Turkish Defense Ministry. Some crucial projects have been carried out in order to redesign various rockets that would increase the capability of the Turkish Land Forces in the late 1990s (Roketsan Activity Report, 2019).

Advanced technologies regarding Laser, rocket, and various war products were gained with the CİRİT 2.75" Laser Guided Missile Project, which was launched by the Turkish Defense Ministry in 2004 in line with the needs of the operation units. Some agreements and contracts for the export of these systems signed in 2004, thus, the period of product and service sales abroad at the system level began (Roketsan Activity Report, 2019).

Roketsan has completed the qualification of the Smart Mini Ammunition in 2016. MAM system was developed by Roketsan in order to meet the requirements of today's battlefield, is offered as a solution that increases efficiency in low-carrying aerial platforms, especially Unmanned Aerial Vehicles (Roketsan Activity Report, 2019).

Roketsan has been involved in various projects like design and technology infrastructure, product development, and command control as per the mission it has undertaken since its establishment. In addition, the company has the ability to design, manufacture, train user personnel, and meet the logistic support needs of weapon systems in line with the requirement of rocket and missile systems (Roketsan Activity Report, 2019).

Roketsan has improved its product lines to include all type of army weapon Systems. They engage with these projects;

a. reorganizing and manufacturing various ammunitions,
b. launch and management systems.

On the other hand, providing various fuels, guidance-control systems, warheads, various algorithms, software, and logistics instruments are other issues. Roketsan, which ranked 98th in the World's Top 100 Defense Industry Firms in 2017, ranked 96th in 2018 and 89th in 2019 (Roketsan Activity Report, 2019).

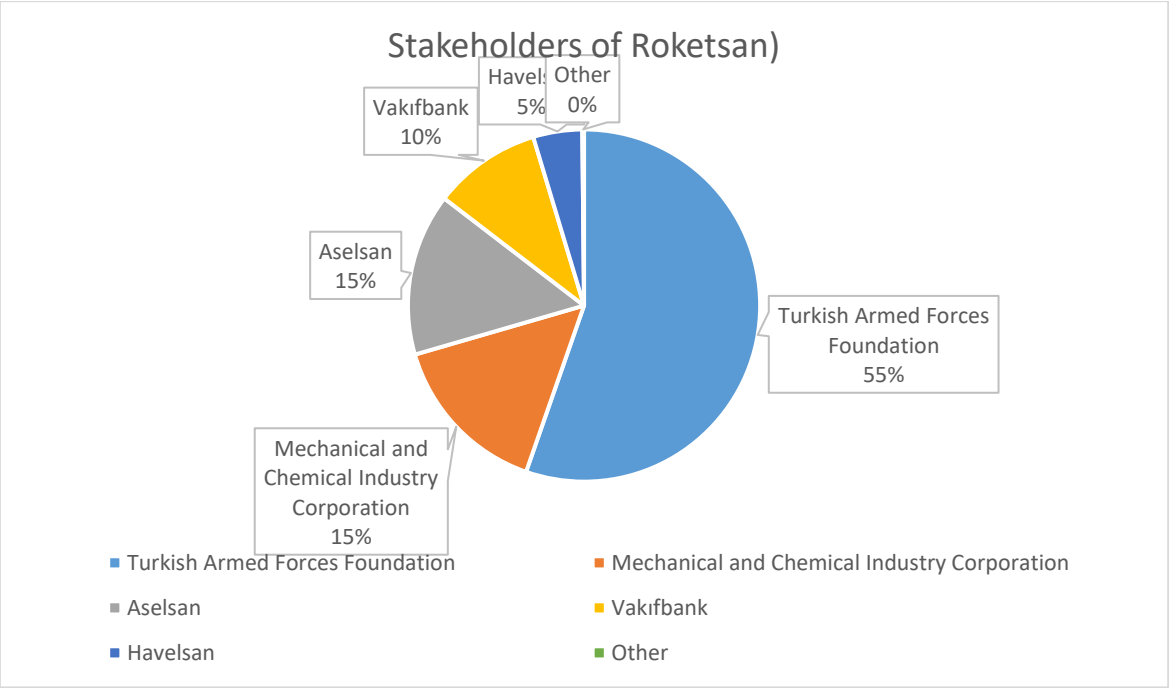


Figure 20: Stakeholders of Roketsan

Source: Roketsan Activity Report, 2019

Approximately 55% of the capital of the company, which is not offered to the public, belongs to the Turkish Armed Forces Foundation. In addition, its remaining capital is distributed among the Mechanical Chemistry Institute, Aselsan, Vakıfbank, and Havelsan (Roketsan Activity Report, 2019).

2.6.4. Tusaş (Turkish Aircraft and Space Industry)

Turkish Aircraft Industry Corporation was established in the Industry and Technology Ministry to decrease external dependency in Turkey's military industry in 1973. Afterward, TAI was founded by TUSAŞ to produce the various type of aircraft, reintegrate the systems on the aircraft and deliver flight tests to our Air Force in 1984. Turkish investors bought TAI's shares abroad, and the company was restructured in 2005. In this context, TAI and TUSAŞ have combined their activities under the Turkish Aviation and Space Industry. This new organization, development, and production in the modernization of the aviation system have been a turning point for Turkey to become a technology center (Tusaş Activity Report, 2020).

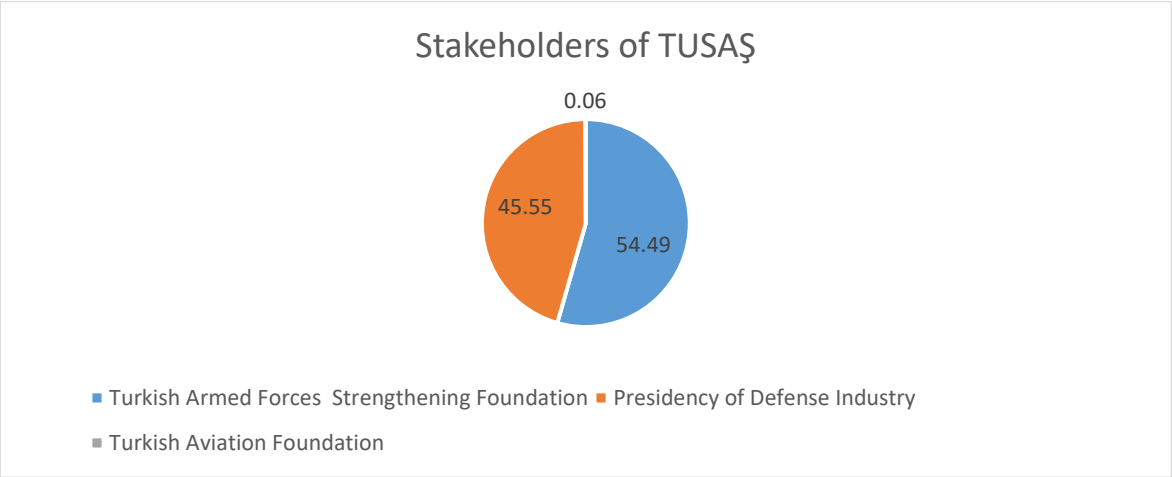


Figure 21: TUSAŞ Stakeholders

Source: Tusaş Activity Report, 2020

On the other hand, TUSAŞ Turkish Aviation and Space Industry was the biggest exporter in the defense and aviation industry in 2018. TUSAŞ Motor Industry, FNSS Foreign Trade, ASELSAN Electronic Industry, Trade, and Alp Aviation Industry Trade followed it respectively.

In the evaluation made by the Defense and Aviation Industry Exporters' Association, it has been stated that the export figures have increased by 130 % since the establishment date. It is stated that the export figure exceeded 2 billion dollars in 2018. In addition, according to the report, the export figure per kilogram reached $ 46.59. Turkey's average is 1.32 dollars. (Defense and Aviation Industry Exporters Association 2019 Report).

According to another noteworthy issue in the report, the defense and aviation sector adds almost 45 times more value to the economy than other sectors (Defense and Aviation Industry Exporters Association 2019 Report).

Project subject groups of TUSAŞ, which are among the top 100 global companies regarding the aviation-space industry, are as follows;

a. Ingredient based,
b. Airplane based,
c. Chopper based,
d. UAV based,
e. Space based,

f. MMU based (Tusaş Activity Report, 2020).

In addition, within the scope of the ongoing projects, the company has 3 aircraft, 6 helicopters, and 2 unmanned aerial vehicles projects. Unemployment and economic growth can be positively affected by the qualified workforce that will work in these projects and especially in the domestic aircraft project. According to the latest evaluations, the domestic warplane is planned to be delivered to the army in 2028 (tusas.com, 2021).

2.7. Turkish Defense Industry

Efforts to supply the requirements of the Turkish Army with domestic and national facilities continue increasingly in recent years. Defense Industry Directorate announced local capabilities which are generated by land, air, and sea systems with domestic ammunition and electronic infrastructure.

According to the report, these capabilities indicate that Turkey's increasingly strong in this area. In this context, the delivery process of VURAN and KİRPİ 2 armored wheeled vehicles produced by BMC continues. VURAN 4x4 multi-purpose armored vehicles, the delivery of which started for the first time in 2019, stands out with their high protection and mobility against mines. KİRPİ 2 vehicles, which have different features from the KİRPİ family, have been developed for the first time. In addition, the first deliveries are planned to be made this year as part of the 6 × 6 Mine Protection Vehicle Project. (Target Magazine sixth issue, 2019).

Rank	**Company**	**Net Sales TL**
15	Aselsan Electronic	7 593 473 730
22	Tusas	5 959 686 554
49	Otokar	3 231 722 468
61	BMC	2 621 379 755
85	Roketsan	2 007 211 188
153	Havelsan	1 209 586 140

181	FNSS Defense	1 094 927 921
327	Alp Aviation	641 365 542
373	Nurol Machine	554 744 884
415	Kale Lock	498 194 909
455	Karel	459 890 847

Table 6: Defense Industry Companies in Top 500 Companies (Turkey)

Source: Istanbul Chamber of Industry Report, 2018

In addition, another important vehicle for the defense industry is the Partially Protected Rescuer Vehicle produced for the Land Forces Command. The Mine Rescue Vehicle is remarkable for its important features and capabilities, including an 8x8 platform, independent suspension, flat tires, central tire inflation, 600 horsepower engine, and automatic transmission (TOBB, 2017).

Also, it is planned to introduce various types and features of vehicles, including the Next Generation Criminal Inspection Vehicle (KIRAÇ), Crime Scene Inspection Vehicle, Hidden Armored Small Bus (GIZKO), and Armored Ambulance in 2021. Within the scope of the Armored Vans and Passenger Vehicles Project launched for the General Directorate of Security, armored vans with hidden weapon towers will be delivered for the first time (Target Magazine sixth issue, 2019).

On the other hand, the first deliveries of BORAN, which is Airborne Portable Howitzer developed by the Mechanical Chemistry Institute, are planned to be done to the Land Forces Command this year. BORAN which was designed to support the Turkish Armed Forces' internal security operations, air operations, and commando brigades, has a 105 mm barrel that can exceed six miles per minute with long-range ammunition. In addition, BORAN, which is used with five personnel and can take positions in less than a minute, is equipped with many types of equipment including a fire control system, GPS, and panoramic binoculars (TOBB, 2017).

It is targeted that the period of 2021 and 2022 will be a period in which the number of domestic ammunition and missile systems increases in Turkish Armed Forces inventory in

terms of both quality and quantity. On the other hand, delivery of the first domestic infantry rifle MPT-76 and compatible rifle bombs and delivery of the domestic pistol METE continue. Finally, the development of artillery ammunition propulsion systems for storm howitzers, which are successfully used in border and outside operations continue (TOBB, 2017).

The United States was the country to which Turkish companies export most in the defense and aviation industry. On the other hand, these companies started to take the Far East and Africa to their targets. With a 17 percent increase in exports, 595 million 248 thousand dollars were exported to the USA in the last year. The USA is followed by Germany with the export of 184 million 776 thousand dollars, and Oman, which prefers armored land vehicles of the Turkish defense industry with the export of 180 million 356 thousand dollars. Also, a Turkish company won the tender for the vehicles needed by the Oman Royal Land Forces. The Turkish company had sold armored vehicles to Oman for $ 513 million in this process (TOBB, 2017).

On the other hand, Turkey's first local-national armed unmanned aerial vehicle Bayraktar TB2 Armed Unmanned Aerial Vehicles were also exported to Ukraine and Qatar in 2020. The Qatar Armed Forces have bought six Bayraktar TB2 Guns. In addition, Azerbaijan has purchased lots of Turkish military vehicles and equipment like armed unmanned aerial and Turkish local and national rifles during the war process with Armenia (Target Magazine sixth issue, 2019).

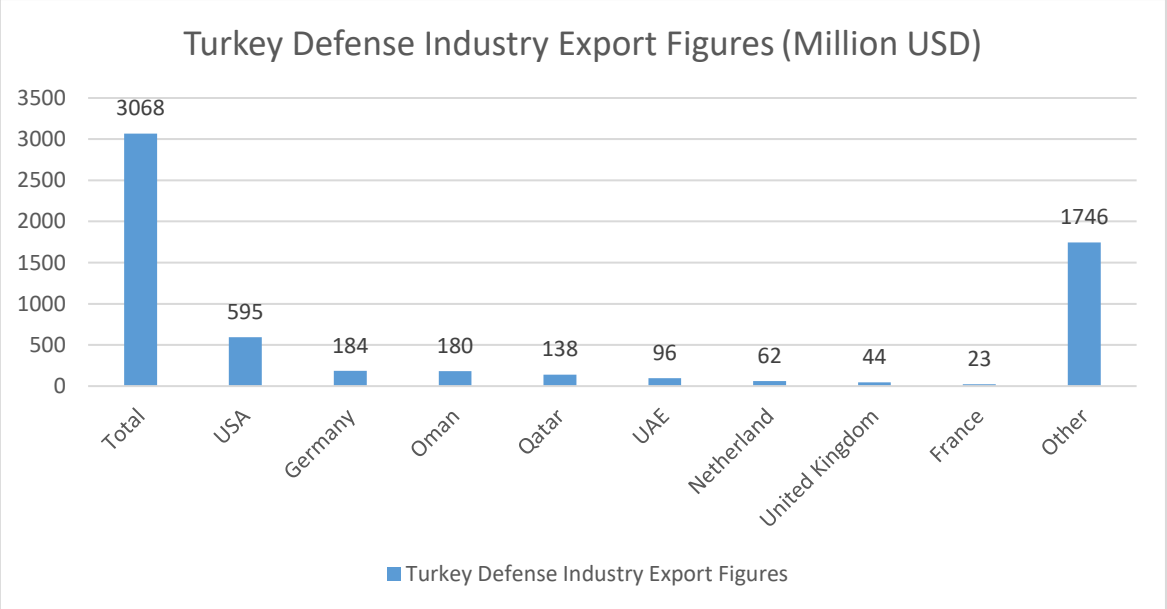


Figure 22: Turkey Defense Industry Export Figures

Source: Defense and Aerospace Industry Manufacturers Association, 2019

Delivery of KORKUT Low Altitude Air Defense Systems continues in missile systems projects. The Low Altitude Air Defense Missile System HİSAR-A, developed by ASELSAN and ROKETSAN and whose tests were successfully completed in 2018, was taken into the inventory for the first time in 2020. In addition, this HİSAR-A missile system developed by ASELSAN and ROKETSAN has an effective preventive feature of up to 15 kilometers against fighter jets, helicopters, unmanned aerial vehicles, and missiles. Also, the medium-altitude missile defense system HİSAR-O also continues the missile firing tests with a warhead. HİSAR-O, which is effective up to 25 kilometers, is planned to be put into service in 2021 (TOBB, 2017).

On the other hand, delivery of Long-Range Antitank Systems UMTAS and L-UMTAS and Medium Range Antitank System OMTAS missiles continues. In addition, it is planned to complete the test shots of the air-to-air missile BOZDOĞAN, which was developed within the scope of the GÖKTUĞ project. Also, this project which was carried out to produce the first domestic and national air missile, and to take it into the inventory may contribute to the Turkish Defense capability substantially. Finally, it seems that the delivery of the SOM-A smart ammunition for HGK, UPS, LGK, and Teber guidance kits for the Air Force and unmanned aerial vehicles will continue throughout the 2020-21 years (Target Magazine sixth issue, 2019).

Rank	**Company**	**Number of employees**
1	Tusaş Turkish aviation and space industry	6994
2	Aselsan Electronic	5480
3	Roketsan Turkish rocket industry	2543
4	BMC	2888
5	Otokar	2069
6	Karel Electronic	1906
7	Havelsan Turkish air electronics industry	1463

8	Alp Aviation	1036
9	Nurol Machine	491

Table 7: Contribution of Turkish Defense Industry Companies to Employment

Source: Istanbul Chamber of Industry Report, 2018

The unmanned aerial fleet, which has been used in the Turkish Armed Forces inventory for a long time, continues to grow with new and improved systems in recent years. In this context, it is aimed to start the delivery of the AKINCI Offensive Unmanned Aerial Vehicle at the end of 2021 year. In addition, it was stated that the first delivery of KARGU, ALPAGU, and Developed Mini Unmanned Aerial Vehicles would start in 2021 (Target Magazine sixth issue, 2019).

On the other hand, it is aimed to complete the detailed tests of ATAK Phase II, the developed model of the first domestic attack helicopter T-129, and start to deliver the first helicopters this year. In addition, it is aimed to start the systems to mission soon (with the aim of defending the coasts), which are produced with domestic facilities (Target Magazine sixth issue, 2019).

The most important development was undoubtedly the launch of the Multi-Purpose Amphibious Assault Ship TCG ANATOLIA. Because TCG ANATOLIAN, which is described as the flagship of the Turkish Navy, has a length of 232 meters and a width of 32 meters. TCG ANATOLIA is able to host a fleet of six F35B fighter jets, four Atak helicopters, eight medium-load helicopters, two Seahawk general-purpose helicopters, and two unmanned aerial vehicles (Target Magazine sixth issue, 2019).

In addition, the delivery and development of electronic systems that form the basic infrastructure of the modern military continue in Turkey. Within the scope of the Friendly Enemy Recognition Identification System Project, integration of national Friendly Enemy Recognition Identification System devices is planned for various air and sea platforms, primarily F-16 (Target Magazine sixth issue, 2019).

2019 Top 100 Defense Industry Companies			
Rank	**Company**	**Country**	**2018 Mil. Industry Revenue (in millions)**
1	Lockheed Martin J.	USA.	$50 537
2	Boeing T.	USA.	$34 051
3	Northrop Grumman R.	USA.	$25 301
4	Raytheon Company M.	USA.	$25 164
5	Aviation Industry Corporation of China	PRC	$24 902
6	General Dynamics	USA.	$24 055
7	BAE Sy.	U.K.	$22 477
8	China NIGCL	China	$14 777
9	Airbus	Netherlands/France	$13 063
10	China ASIC	PRC	$12 130
11	China SIGC	PRC	$11 963
12	China Electronics Technology Group	PRC	$10 275
13	Leonardo	Italy	$9828
14	China SIC	USA.	$9795
15	Almaz-Antey	Russia	$9660
16	Thales	France	$9575
17	United Technologies	U.S.	$9310
18	L3 Technologies	U.S.	$8249
19	China ASTC	PRC	$8138

20	Huntington II	USA.	$7767
52	Aselsan	Turkey	$1792
69	Turkish Aerospace Industries (TAI)	Turkey	$1050
85	STM Savunma TMT	Turkey	$564
86	BMC OST	Turkey	$554
89	Roketsan A.S	Turkey	$376

Table 8: Top 100 Defense Industry Companies (World)

Source: https://people.defensenews.com/top-100/Report, 2019

On the other hand, Turkey Exporters Assembly December 2019 Report shows that the share of Defense and Aerospace Industries in Turkish exports has signed a new export record. According to the export figures shared by the Turkish Defense and Aviation Industry, the Turkish Defense and Aviation Industry exported $ 288 million 660 thousand in December 2019. Total exports made by the sector throughout 2019 increased by 34.6% compared to the previous year and reached 2 billion 740 million 988 thousand dollars. Thus, the Turkish Defense and Aviation Industry reached a new export record in 2019 (Turkey Exporters Assembly December 2019 Report).

2019 Data of Turkish Defense Industry	
Sales	10 884 081 347 $
International Sales Income	3 068 519 809 $
Imports	3 088 465 821 $
R&D Expenditures	1 672 052 468 $
Employment	73 771 People

Table 9: Data of Turkish Defense Industry

Source: Defense and Aviation Industry Manufacturers Association Report, 2019

The highest proportional increase in the exports of the Turkish defense and aviation industry, which increased its export performance in 2019, occurred in free zones with 1174 percent. The Middle East with an increase of 128 % and the Commonwealth of Independent States with 104 percent followed Free Zones. Exports to the Middle East and Commonwealth of Independent States have nearly doubled. Exports to the Middle East countries amounted to 710 million 144 thousand dollars and to Commonwealth of Independent States 240 000 912 000 dollars. On the other hand, the highest export was made to the North American Free Trade Zone, where the USA is located, with 841 million 397 thousand dollars (Turkey Exporters Assembly December 2019 Report).

According to the 2018 annual report of the Defense and Aerospace Industry Manufacturers Association, the total foreign sales revenue of Turkish defense industry companies amounted to $ 2188 million. While 2035 million dollars of this amount constitutes export revenues, the remaining 153 million dollars are other transactions that bring foreign currency. While the Middle East, Asia, Africa, and South America countries rank first in international sales revenues with $ 969 million, the USA follows with $ 698 million and European countries with $ 521 million (Istanbul Defense and Aviation Industry Manufacturers Association Performance Report, 2018).

THIRD PART

3. Literature Review

Military expenditures, which are pure public goods and constitute the opportunity cost of other expenditures that may directly affect the development of countries, have been frequently investigated by economists in the historical process. The impact of military spending on macroeconomic indicators has been the focus of the many studies. The issue of how defense spending has an impact on the economy has always been one of the issues discussed. *Classical economists* approached the issue with the negative effect of military expenditures on the macroeconomic indicators and especially economic growth. These economists focused on the fact that the resources allocated for defense impose a burden on the shoulders of the state. According to classical economists, not only military spending but also all compulsory public spending is a heavy burden on the state (Yağtu, 2019). Their main argument claim that the market spontaneously reaches the optimal balance in line with the personal interests of actors outside the state and full employment is provided. In this sense, the states should keep defense spending to a minimum level. On the other hand, economists who adopt Keynesian Economic Theory brought a different perspective to the issue after the 1929 Depression. According to them, state military spending as one of the public expenditures increase the demand and this increased demand cause a multiplier effect in the market (Deger, 1986). They claimed that the multiplier effect of military spending would create a boom in the economy. Thus, with this enhanced military spending may cause to increase economic growth in the country. However, in all studies, it was stated that defense expenditures should be made in terms of the sovereignty, reliability and investment capability of the countries. Because, although country budgets and resources are limited, defense spending is mandatory for all countries to create a suitable trade environment for foreign investors.

. When we look at the studies made throughout the history, we see that by some studies found a positive relationship, others found negative one between military expenditures and level of economic growth. In addition, still others found no relation.

While investigating the effects of military spending on macroeconomic indicators; conflict environment, the geographical situation and distance to the natural resources and transportation routes, level of development, population, membership status to the international organizations, foreign dependency in energy, expert and export based

technology level, local and global financial crisis periods, political management of the country, state of civil war and many other factors are effective (Asiloğulları, 2019).

All the factors mentioned above have created different effects for different countries and organizations in different periods. Thus, researches are not conclusive regarding the economic effects of expenditures for armies on macroeconomic indicators like growth, budget deficit, inflation and employment.

On the other hand, when we look at the studies regarding military expenditures employment (an element which is related with economic growth) nexus, this relation is also inconclusive. Of course, this relation may change with the circumstances which the related country has (Yıldırım and Sezgin, 2003). If the country has an employment ratio under optimum standards, in addition, if there is not certain and foresighted planning for the labor force in the country, military expenditures may affect employment positively. Also, the structure of public universities is also very determinative at this point. If graduate students cannot get a job regarding their university department, they may go towards other business lines to put bread on the table. For instance, part of the labor requirement of police, gendarmerie, and other military services is provided by the non-military schools in the countries like Turkey. Students which graduate from non-military university departments make a job application for the defense sector.

In addition, if the high military expenditures help the country to get rid of foreign dependency, it may also affect employment positively (Deger, 1986). A self-sufficient country can get all heavy military industry products from local factories. With the increased high technological factories lots of well-educated labor force may be employed. Thus, military expenditures may affect employment and accordingly economic growth positively in the countries which are self-sufficient and have export-based high technological defense industry.

However, military expenditures may affect employment negatively in developed countries which have organized education infrastructure, well-educated labor force and state organization which has foresighted planning for the labor force (Yıldırım and Sezgin, 2003). Because these well-educated labor forces may be used for high-tech and growth-friendly productive sectors. Also, developed countries like the USA, England, and Russia which have a big share of the defense industry market in the world, may choose to use low price labor prices for their investments. So, they may plan their investments to the countries which have

low-cost labor. Hence, while military expenditures may no effect on employment in developed countries, they may affect employment positively in the countries in which developed countries invest in (Deger, 1986).

Also, according to the studies, military expenditures may have no effect on employment in the oil-rich or tourism-based rich island countries. Because they have per capita income far better than average. While especially during war and conflict periods in which defense expenditure burdens rise, even though this huge burden may cause detrimental outputs for middle-income economies, oil-exporting rich countries may manage to compensate for this huge cost of military expenditure (Yağtu, 2019).

Although the existence of military spending dates back to ancient times, impact of these expenditures on economy started to attract interest of researchers especially after Second World War. Especially, economic turndown after the oil crisis and increased armament with respectively Cold War, Arab-Israel war and Gulf Crisis caused to countries to sharply increase rate of their defense budget. Naturally, effecting of these huge defense budgets to the economic indicators like economic growth, employment, budget deficit and inflation were started to wonder by researchers. Thus, the first studies were made by Szymanski and Benoit in seventies.

Szymanski (1973) commented the military expenditures economic indicators nexus. Firstly, he detected that increasing military expenditures cause to increase employment in both military and nonmilitary industries. However according to his research, these unproductive expenditures caused to decrease in economic growth especially in developed countries which have strong economic infrastructure. On the other hand, he stated that nondefense productive expenditures effect economic indicators especially economic growth to a large extent positively. As a conclusion of his dissertation, although it varies by country to country, Szymanski recommended that nonmilitary productive expenditures should be used to exhilarate economic growth level of countries.

Benoit (1978) investigated the interaction between defense expenditure and economic growth for the first time and found the positive relationship between these two indicators, his study attracted many more researchers' interest on the subject. In the famous economist's study, 44 developing countries for the period 1950-1965 were examined. Benoit concluded that military spending may increase economic growth positively as a result of his study. The positive aspect of the relationship attracted the attention of other economists around the

world, and it was the beginning of many new researches on the subject. This study has entered the literature as the Benoit Hypothesis. Benoit, in this hypothesis, performed an analysis with traditional panel regression and correlation method with growth and defense data. As a result, a strong positive correlation was found between defense spending and growth rates.

On the other hand, Smith (1980) analyzed 14 OECD member countries in his study. His research covered the years between 1954 and 1973. As a result of this detailed study, he concluded that increasing defense spending negatively affected investment plans in OECD member countries using Keynesian investment model. In addition, he reported that this negative situation about the investment plans accordingly may cause to decrease on economic growing.

In addition, Capra (1981) conducted a comprehensive study to determine the relationship between military spending and inflation in the United States. Using Panel Data Analyses and based on the data between 1962 and 1981, he concluded that defense spending has a negative impact on inflation.

Also, Biswas, Basudeb and Ram (1986) analyzed 58 underdeveloped countries with using the Traditional and Feder sector model (a model of dualistic growth is derived in levels, suitable for time series analyses in 1982). In their study, they evaluated the data of the two periods between 1960-1970 and 1970-1977 separately. They concluded that military expenditures had no positive or negative effect on economic growth.

Babin (1986) conducted a study which he searched relationship between defense expenditures and economic growth with 20 years of data from 104 underdeveloped countries. He used Panel Regression analysis in his extensive work. As a result of his study, he concluded a positive interaction between military spending and indicators especially economic growth.

Johnson and Wells (1986) tried to determine the linkage between high defense expenditures and welfare in Soviet Union for 29 years 1951 to 1980. According to their research, there was a negative correlation between rising military expenditures and housing. In addition, production of consumer durables may be effect negatively from rising of defense expenditures.

On the other hand, Landau (1986) analyzed the interaction between military spending and economic growth. In addition, he used data's from 65 underdeveloped countries spanning 20 years period from 1960 to 1980. He used the Multivariate traditional model to test his thesis in his research. As a result of his study, he found that military spending may increase economic growth positively, albeit with a lesser increase.

Barro (1987) has carried out a wide-ranging study between 1701 and 1987. The interaction between defense spending and economic growth has been analyzed with Regression Analysis. In addition, he used UK economic data's which spanning 286 years. As a result of the study, Barro could not detected a interaction between increasing military spending and economic growth in UK.

In the study conducted by Kinsella (1990) which covering the period 1943-1989, the interaction between expenditures for army and total output was analyzed with using the vector auto regression model. In addition, relationship between price level, unemployment rate and interest were used as variables. In this study, Kinsella investigated the relationship between military expenditures and financial outputs by evaluating the economic data of the United States. According to the results of the comprehensive evaluation carried out, no relationship was found between defense expenditures and financial statement data such as price level, unemployment rate, interest and total output.

Also, in the study conducted by Mueller in 1990, after Second World War period was chosen as the period subject of the study. The reflection of the war on financial markets and the effects of the increasing military expenditures during the war post period were analyzed. Mueller analyzed the economic indicators of the United States between 1949 and 1989 with the Feder Type model. As a result of his comprehensive analysis and evaluations, he concluded that the increasing military expenditures caused an increase in economic growth, albeit to a lesser extent.

Chowdhury (1990) analyzed the data of 55 developing countries with the Granger Analysis method. He used defense spending and growth rates between 1961 and 1987 as a data in his research. It has been concluded that while increasing spending for army has a affirmative effect on economic growth in some countries, it has a negative effect in some countries. This differences may be occur because of structural and geographical differences of countries. On the other hand, level of economic infrastructure is also determinative.

According to most important output of research of Chowdhury, there was no direct interaction between spending for army and economic growth.

Biswas, Basudeb and Ram (1993) included 74 developing countries to their study. They analyzed the data of 74 developing countries between 1981 and 1989 with the Feder Type Model. As a result of their evaluation, they concluded that the increasing defense spending has an affirmative effect on economic growth in these countries. On the other hand, according the one of important outputs of their research, these increased expenditures may trigger the demand and so may revive the economy.

In addition, Landau (1993) conducted a study regarding to military expenditures and economic indicators nexus with using the Multipurpose Growth Model. In his detailed analysis, he examined the economic processes and outputs of 71 underdeveloped countries between 1969 and 1989. He concluded that increased military spending created a vitality in demand and increased economic growth positively with the multiplier effect in the first period. However, he detected that the increased financial burden due to the allocated shares to military expenditures destroyed the positive increase which in the first period in the ongoing process.

Ram (1994) who searched the relationship between economic growth and military expenditures conducted his comprehensive research with 71 less-developed countries from different zones of the world. While he was conducting his research he used two different types of econometric models to determine the correlation between rising expenditures for army and economic growth. In addition, he distinguished his research to three different time periods (1965-1973, 1973-1980 and 1980-1990). As the output of his research, there was not any effect of military expenditures on economic growth positively or negatively regarding to Feder Type Sector Model testing. On the other hand, positive and as well as negative effects of military expenditures on economic growth were detected regarding to Conventional Model testing. According to thesis of Ram, different time periods and different economic conditions of countries were effective to get these independent outputs.

Macnair (1995) analyzed military expenditures and economic growth correlation of 10 NATO member countries for 37 years which cover the period 1951 to 1988. In addition, he used Feder Type Model for his research. As a result of his comprehensive research on NATO member countries, he concluded that the multiplier effect of spending for army caused an affirmative increase on economic growth in 10 NATO member countries.

Özmücur (1996) studied the effects of the cold war period to the Turkish economy in his study. During the Cold War, since its strategic location Turkey accelerated its armament like most of other countries which did not attend to war but may be effect from the effects of war easily due to their location. Özmücur determined that there was a rapid increase in military expenditures with the increasing armament. In the research which was used Panel Data Analysis by Özmücur, it was seen that the rapidly increased military expenditures caused a decrease on economic growth and welfare of the country.

On the other hand, Batchelor (2000) studied the civil war period of the Republic of South Africa between 1964 and 1995. The effect of military expenditures, which increased during conflict for 30 years to ensure peace and security in the country, on economic indicators was analyzed. As a result of the study conducted by Batchelor, it has been determined that military expenditures had negative consequences on all economic indicators.

Sezgin (2000) analyzed the connection between economic growth and military expenditures in Turkey and Greece. Using Error Correction Mechanism, he concluded that although Turkey and Greece are the countries which their defense budget higher than other NATO countries, military expenditures do not effect economy negatively. According to his study, quite the contrary, military expenditures effected their economies positively in the period of 1955-1994.

Sezgin (2001) has used data's regarding to Turkish economy which reflects 1956 and 1994 period. He tested his thesis with the Demand-Supply Oriented Model. In his examination covering a period of 38 years, he found that macroeconomic variables may change positively due to the increasing military expenditures. Sezgin concluded that Keynesian effects of defense expenditures trigger the demand and this rising in demand cause to revive of all sectors of economy.

On the other hand, Shieh (2002) who arranged a detailed and comprehensive study related to military expenditures, addressed another dimension of military expenditures. According to this new allegation, level of defense expenditures is certain determinative for economic indicators like economic growth and budget deficit. So, there is a most critical point level for defense expenditures to shrink or enhance the economic growth. So, till the military expenditures reach this certain point, they have trigger effect for demand and consequently economic growth. However, after this certain point rising military expenditures cause to shrink on demand and consequently as well as economic growth. In

addition, as the Shieh concluded in his research, to determinate level of military expenditures security problem and economic development level of related countries are crucial.

Sezgin and Yıldırım (2002) analyzed the Turkish military expenditures for the period between 1951 and 1998. Using ARDL method, they founded that size of defense budget of Turkey has a direct relationship with the NATO-Greece defense budgets and security requirements regarding to his geographical position.

Sezgin and Yıldırım (2003) searched the relation between military expenditures and employment for the period between 1950 and 1997 in Turkey. Using ARDL method, they concluded that military expenditures effected the employment negatively. Because, they detected that most of the military expenditure was allocated to expense of military personnel. In addition, Turkey imported all high technology military products and this did not contribute to increase of employment.

In addition, Dunne (2004) has analyzed the 11 developing countries which include Turkey with Panel Data Analysis. As a consequence of his comprehensive work he found that, military expenditures created a positive reflection on growth and gross domestic product figures between the years 1960 and 2000.

Sezgin (2004) investigated the interaction between military spending, arms imports, and external debt. Using 1979-2000 data and Co-Integration Analyses, he found that external debt affects economic growth negatively in the long period in Turkey. In addition, according to his research, rising arms exports affected negatively the indebtedness of Turkey in the short run.

Sezgin and Yıldırım (2005) analyzed that how the level of democracy effects the military expenditure and defense budgets of countries. Using Panel Estimation Technique, they investigated 92 countries for the period between 1987 and 1997. According to their study, they founded that military budgets are lower in the countries which have high level of democracy than the countries which have lower democracy level.

Sezgin, Yıldırım and Öcal (2005) investigated the relationship of defense budget and economic growth for Middle Eastern Countries and Turkey for the period between 1989 and 1999. Using panel estimation technique, they founded that military expenditures have positive effect on the economic growth for these countries. According to their study, because defense sector uses more high technology rather than other sectors, it is more productive.

In the study conducted by Yakovlev (2007), the data's of twenty-eight countries for the period 1965-2000 were examined. Importance of the effects of spending for army and net weapons exports for growth were investigated using by the Solow-Barro model. According to the empirical findings obtained in this study, when evaluated separately, it was concluded that high level of defense expenditures and net arms exports led to a lower economic growth.

On the other hand, Hou (2009) used Indian data's which cover 1960-2007 period for his study. As a result of his examination with and Panel Data methods, he found a negative correlation between army expenditures and economic growth.

In 2009, a comprehensive analysis was made by Ateşoğlu with the data of the United States. As a result of an evaluation which was made with Granger Analysis method covering 49-year period (1948-2007), Ateşoğlu determined that there is a positive interaction between defense expenditures and economic growth. In addition, he concluded that increasing military expenditures cause to increase on economic growth and decrease on unemployment.

Also, Yılancı and Ozhan (2010) investigated the relationship between defense expenditures and gross domestic product in Turkey in their study. As a result of their detailed and comprehensive study, a unilateral relationship between gross domestic product and defense expenditures has been determined.

Braşoveanu (2010) analyzed the impact of military spending on economic growth for Romania. Using Regression Analyses, she found that military expenditures have a big potential to affect economic growth negatively. However, according to her study, resources are limited and if they are used to produce high technology defense industry products and invest in new factories, military expenditures may affect economic growth positively. In addition, they may cause to increase employment through new factories. Otherwise, if they are used to import military products and salaries of military personnel, these expenditures may cause unproductive results and affect economic growth negatively like in Romania.

Yıldırım and Öcal (2010) analyzed the effect of terrorism on the economic growth in Turkey for the period between 1987 and 2001. Using regression analyses, they concluded that terrorism caused to decrease of economic growth especially in the Eastern and South eastern part of Turkey. In addition, according to their study, education level is very determinative for economic growth.

Ahmed (2012) worked on the financial burden of increasing defense spending of 25 African countries. In this context, he examined the reflections of military spending, which increased in African countries due to security weakness and internal turmoil, on the economy. Using Panel Data Method in his analysis, it has been determined that the periodically increasing defense expenditures in Sub-Saharan African countries put a heavy debt burden on the countries. In addition, it has been observed that the increasing debt burden caused a rapid rise in the current account deficit. According to Ahmad's comprehensive analysis, there is an inverse relationship between military spending and economic indicators like economic growth.

Zaman, which examines Bangladesh's data regarding military expenditures and foreign borrowing for the 30-year period from 1980 to 2009, completed his study in 2012. In addition, in his study, he searched the causality between increasing defense expenditures and external borrowing and the burden it puts on the economy. Using the Granger Analysis method, he found a one-way relationship between increasing defense expenditures and foreign borrowing.

In addition, D'Agostino (2012) got opposite results from who support military expenditures have multiplier effect to enhance economic growth levels of developing countries, in his comprehensive research related with African developing countries. He detected that large defense expenditures strongly may affect economic growth negatively after his 5 years' observation on 53 African Countries. According to the outputs of his research, rising military expenditures may cause to shrink on demand and this situation effect the economic growth negatively.

On the other hand, Başar and Kunu (2012) investigated the effect of defense spending on growth for thirty-six selected countries including Turkey by making regression estimates with panel data in their study. It was found that there was a negative correlation between increasing military expenditures and economic growth which reflects the period of 1997-2004.

Also, Dunne (2012) confirmed that rising military expenditures have negative reflections on per capita income growth in Sub Saharan Africa countries. On the other hand, his comprehensive study covered 18 years period (1988-2006). In addition he used cross-country panel data set for his comprehensive dissertation. According to his research,

increased unproductive military expenditures cause a burden on the economy. Thus, this burden decreases the economic growth and accordingly GDP Per Capita.

Korkmaz (2012) researched the correlation between increasing military expenditures, economic growth and unemployment in Mediterranean Countries. Especially, there was a sharp increasing in military expenditures in these countries during the Arab Spring period. So, researchers wondered about reflections of these expenditures to economies of Mediterranean Countries and they focused to this issue. Using Panel Data Analyses, Korkmaz found that military expenditures effect the economic growth negatively. Furthermore, military expenditures caused to increase unemployment.

Zhong (2012) studied regarding to effects of expenditures for army on economic indicators in US and BRIC Cooperation (Brazil, India, Russia, China and South Africa). He concluded to data of 24 years for period between 1988 and 2012. Using Granger Analyses Method, he detected that there are crucial differences for developing and developed countries. While increasing military expenditures caused to positive reflections on the economy for developed economies, they caused to deteriorate on the economy (especially economic growth and unemployment) for emerging economies.

Yıldırım and Öcal (2014) analyzed the relationship between military expenditures and economic growth for the period between 2000 and 2010 in the 128 countries. Using Solow Model, they founded that defense expenditures effected economic growth positively for that time period.

Töngür and Elveren (2014) investigated the relationship between defense spending, income inequality, and economic growth in Turkey for the period between 1963 and 2008. Using Solow Model, they found that income inequality affects economic growth positively. In addition, according to their research, defense spending has no effect on economic growth.

Also, Dunne and Tian (2015) approached the issue from the different perspective. According to output of their work, there was a negative relationship between rising defense expenditures and economic growth in the short and as well as long run. In addition, this research which spanning 1988-2010 period, covered all different income groups (for changeable levels of conflict history, natural resources and income) from different countries.

A different perspective to the issue was evaluated by Musayev (2015). Musayev researched the interaction between army expenditures and economic growth. In addition, he

considered the indicators which affect the level of military expenditures directly or indirectly such as corruption, internal or external conflicts, and natural resources. He concluded that the impact of defense expenditures on economic growth is negative under normal circumstances. However, these problems should be solved for countries that have high-level internal conflicts or corruption to be attractive for internal-external investors. Otherwise, if this conflict situation will not be solved these countries may be exposed to bottleneck inflation.

Sezgin (2015) investigated the relationship between Turkish defense spending and economic growth for the period between 1924 and 1994. Using Granger Causality Test, he concluded that there is a relationship (bidirectional causality) between these two indicators.

Gokmenoglu, Taspinar, and Sadeghieh (2015) analyzed the interaction between military expenditure and economic growth in Turkey for the period between 1988 and 2013. Using Co-integration analyses, they found that there is a unidirectional causality between these two indicators (from economic growth to military spending). However, according to their research, there is no causality from military expenditure to economic growth.

Compton and Paterson (2015) documented a relationship between the strength of institutions, increasing defense expenditures, and economic indicators. Using Dynamic Panel Data Analyses, they found that, the strength of institutions of countries is very determinative to see the effect of military expenditures. As an output of their study, they detected that rising defense expenditures may cause negative externalities regarding economic indicators. For instance, especially in countries that have weak institutions, the effect of defense expenditures on economic growth is generally not positive. This effect is not positive even in countries that have a strong institutional infrastructure. However, it was seen that military expenditures may cause to increase on the export level and economic growth and also decrease the budget deficit in countries which are not foreign dependent and high technology producer.

Yıldırım, Karadam ve Öcal (2016) analyzed the relationship between military expenditures and economic growth in Middle East Countries and Turkey for the period between 1988 and 2012. Using Panel Data, they founded that relationship between military expenditures and economic growth is non-linear. According to their study, defense expenditures and military products import may effect economic growth negatively.

Heo (2016) analyzed the relationship between defense expenditure and economic growth for US states for the period from 1990 to 2012. According to his research, military expenditures cause to block private investment. However, these expenditures may increase employment. Nevertheless, the effect of military spending on economic growth is minimal.

Harutyunyan (2016) investigated about the correlation between defense expenditures and economic indicators. In this study, he focused to poor Sub Saharan Countries which have weak economic infrastructure. He detected from his study that reflections of military expenditures in the economic indicators of these countries are variable. According to Harutyunyan, sometimes military expenditures may cause to increase to new public investments with their multiplier effect. However, whether the output of this expenditures are successful are related with effectiveness and productivity of military expenditures. So, this means, if these expenditures directed to production of new generation technology products for export, they would decrease budget deficit of countries and enhance economic growth. Otherwise, these unproductive expenditures may increase the budget deficit and accordingly external debts.

Lin and Young (2016) tested whether reflections of military expenditures on the inflation rate are positive or not. Using the Co-integration Test and the data regarding defense expenditures and inflation rates of 1955-2010 years period of China, Japan, South Korea, and Taiwan, they got different outputs from different countries as a result of their investigation which covers 45 years periods of related countries. For instance, increasing military expenditures caused to decrease in inflation rates in China and Japan. However, these expenditures caused to increase inflation rate in Taiwan. Of course, as one of the outputs of his research, he detected high saving level of Japan been effective for these low inflation rates.

Canbay and Mercan (2016) approached the issue from a different perspective. They used 1986-2016 period military expenditures and import rates data's of Turkish Economy. In addition, using Vector Error Correction Model tested reflections of import-based defense spending to the economy. They detected as a conclusion of their research that there is a negative interaction between imports-based military expenditures and growth. As a conclusion of their research, they found that these expenditures may cause to increase the budget deficit and decrease economic growth.

Warkowski and Wylie (2017) analyzed the interaction between army spending and economic growth in selected Indo-Pacific-Asia countries. Using Granger Causality Test, they concluded that there is bidirectional causality between army spending and economic growth.

Phiri (2017) investigated the relationship between military spending, economic growth, and other indicators which affect the economy in South African economies for the time period between 1988 and 2015. Using logistic smooth transition regression, he found that level of army budgets is too high for South African economies and according to his research, this spending should be directed to more productive areas like infrastructure and education to trigger the economic growth level of countries.

Xu (2018) researched whether increasing military expenditures affect the inflation rate positively or not in China. He used 1953-2014 period military expenditures, economic growth, and inflation rates of China. According to the output of his test, he detected that increasing military expenditures did not cause to increase in the inflation rate. As a conclusion of his research, he evaluated that export-based military expenditures may cause to decrease in the budget deficit and accordingly inflation rate.

Sezgin (2018) analyzed negative and positive effects of defense industry on the economy in Turkey and World. According to the study, although America and a few other developed countries have the most of the share of the world defense industry market, Turkey started to increase its capabilities on high technology defense products. In addition, he concluded that as a positive effect of defense industry, it may create a suitable environment for internal and external investors and also may cause to increase of employment.

Sezgin and Erdem (2018) investigated the interaction between defense expenditures and economic growth. They founded that military expenditures increased in the East and Middle East European countries because of economic and politic reasons whereas they increased in Turkey because of geopolitical position. According to their study, defense budgets of countries may effect economies positively through with triggering the high technological investments and these budgets may effect economies negatively through with disregarding the infrastructure and education investments.

In addition, Topal (2018) examined the interaction between army expenditures and economic indicators like GDP Per Capita, economic growth and unemployment in Turkey for 30 years period between 1980 and 2010. After his detailed and comprehensive work he

got some crucial outputs. According to this study, there was no correlation between rising military expenditures and economic growth due to changeable economic conditions by the time. He evaluated that military expenditures may cause to increase economic growth as well as export level and decrease budget deficit in the countries which produce and export high level generation products. Furthermore, these military expenditures may cause to increase budget deficit and technological foreign dependency. So, this situation may deteriorate economic structure of countries which cannot produce their high level generation products.

Bove and Deiana (2018) analyzed the interaction between defense industry products and energy (especially oil) dependence for the selected countries for the period between 1992 and 2014. Using Gravity Model, they found that oil-rich countries can use their position to sign defense industry agreements with developed countries that produce high-level technology military products. In addition, developed countries can use their high-level defense industry as a tool to keep the security of access to oil reserves.

Şit (2018) investigated the interaction between army spending and macroeconomic indicators for Turkey for the period between 1980 and 2016. Using the Granger causality test, he found that defense spending has a very close relationship with macroeconomic indicators in Turkey. According to his study, military expenditures may cause to increase inflation through cause to demand increase. In addition, he concluded that defense spending may cause to increase export of defense products and this situation may cause to deteriorate the current account imbalance.

Su and Tao (2018) analyzed the relationship between inflation and military expenditure in China for the war and peace periods separately. Using Wavelet Analyses, they found that the relationship between military spending and inflation varies over time. According to their research, there is little evidence supporting Chinese military expenditure is inflationary. More than half of military expenditure is used for non-productive and inflationary maintenance. Nevertheless, military expenditure did not affect inflation negatively in the past four decades. In addition, expansion in inflation is at a low level compared with state revenue and local productivity.

Çetin and Güzel (2018) researched relationship between defense budget and economic growth for selected MENA countries for the period between 1990 and 2017. Using Panel

Model, they found that military infrastructure spending has a huge negative effect on economic growth.

Rahman (2019) analyzed the interaction between army spending and economic growth for selected 85 countries for the period between 1985 and 2017. Using GMM Technique, they found that military expenditures have a negative effect on economic growth because of the less money which is used for education, health, and infrastructure. According to their study, there was only one exception that military expenditures affect economic growth positively. He concluded that, if the countries have high military technology level and can export their products to other countries, this situation may cause to increase in economic growth.

Şuhan (2019) investigated the influence of defense expenditures on macroeconomic sources and methods of financing. According to her research, she concluded that the level of military budgets is determined according to different dynamics such as economic growth, the level of corruption, public debt and the level of development of the defense industry. These dynamics can yield different results when done in peacetime or in conflict-time.

Dunne (2019) analyzed the interaction between army spending and economic growth for selected countries for the period between 1960 and 2014. Using Panel Analyses he focused on especially investment channels. According to his research, there is not a strong interaction between army spending, investment, and economic growth.

Ramda and Supandi (2019) analyzed the determinants of military spending in Indonesia for the period between 1985 and 2016. Using a partial adjustment model, they concluded that demography and GDP affect military spending positively in the short and long periods. However, the exchange rate affected the defense budget negatively.

Saba and Ngepah (2019) investigated the interaction between economic growth and defense budget in the selected 35 selected African countries. Using Panel Technique for the time period between 1990 and 2015, they found that causality results change country to country. Although there is no causality in some African countries, there is bidirectional causality in some countries. According to their research, defense spending has a negative influence on economic growth in most of the selected countries.

Çevik and Bektaş (2019) analyzed the relationship between army spending and economic growth in Turkey for the period between 1968 and 2017. Using causality analysis

they found that there is a unidirectional causality relationship between military spending to economic growth. In addition, they concluded that sudden increases in military spending negatively affect national income in the long run, resulting in a decrease.

Odehnal (2020) analyzed the effect of military expenditures on macroeconomic indicators in the Baltic Zone (Lithuania, Latvia, and Estonia) for the period between 2001 and 2018. Using the ARDL model, he found that the defense spending of Estonia and Lithuania depended on the state budget deficit. He concluded that the growing economic infrastructure of Estonia caused to increase in military spending. According to his study, there was a negative connection between the military spending level and some economic variables (budget deficit, indebtedness, the decline in GDP). In addition, there was a positive relationship between the inflation rate and the military expenditure level.

Emmanouilidis and Karpetis (2020) investigated the relationship between army expenditures and economic activity in the US for the period between 1961 and 2015. Using time-series methodologies, they found that army expenditures affect economic activity negatively.

Karakaya and Şahinoğlu (2020) analyzed the interaction between military spending and economic growth in Turkey for the period between 1984 and 2016. Using the ARDL Boundary Test and the Johansen Co-integration Test they obtained separate results for both tests. While according to the results of the Johansen Co-integration Test, there is a negative relationship between military spending and economic growth in the long term, according to the ARDL Boundary Test results, military spending and developments in military technology affect positively economic growth in both the short and long term.

Tao and Glunt (2020) investigated the interaction between defense spending and sustainable economic growth for the period between 1996 and 2006 in Romania. Using Bootstrap Technique, they concluded there were negative effects of military spending on sustainable economic growth especially through a crowding-out effect on private investments. However, according to their study, increasing of employment rate can be said the only positive effect of military expenditures.

Huskic, Satrovic and Muslija (2020) analyzed interaction between army spending and economic growth for MIST (Mexico, Indonesia, South Korea and Turkey) Countries which army spending compose most of the state spending for the period between 1974 and 2018. Using Panel data analyses, they concluded that army spending (since it decreases capital

stock, productivity, and saving) has a negative impact on economic growth in the long period.

Trueba, Arahuetes, Domonte, and Curto (2020) investigated the relationship between military expenditure and economic growth in Spain for the period between 1960 and 2018. Using Granger Causality Model they found that there is positive bi-directional causality from defense spending to gross domestic product.

Sözen and Tufaner (2020) analyzed the interaction between defense spending and economic freedom for selected MENA (the Middle East and North Africa Region) countries for the period between 1996 and 2018. Using Panel data analyses, they found that some indicators like economic growth, trade freedom, and tax burden have a positive effect on defense spending. In addition, some other indicators like investment and monetary freedom, and property rights have negative effects.

Erdugan and Özçelik (2020) analyzed the interaction between employment and defense expenditure for Turkey and EU Countries. Using Panel Data Model and 1993-2017 inputs they concluded that defense expenditures affect employment negatively in the long run. In addition, this situation leads to an increase in the poverty level in society.

Polat (2020) analyzed the relationship between defense spending and economic growth for Turkey other selected countries for the period 1992 and 2017. Using Panel Data Analyze, he found that there is a causality relationship from national income to military spending in the long run. In addition, he concluded that there is a causality relationship from military spending to national income both in the short and long run.

Gül and Torusdağ (2020) investigated the relationship between the current deficit, army budget, and economic growth in Turkey for the period 1990 and 2017. Using Granger Test they conclude that there is a causal relationship between arms exports and employment in the defense industry to defense expenditures. In addition, they found that there was no link between military spending and economic growth.

Blum (2021) investigated the interaction between the third wave of democracy and military expenditures in 110 selected countries for the period between 1972 and 2013. Using Panel Data Model, he found that this wave caused the reduction of army budgets in the experienced democratic countries by approximately ten percent.

Nugroho and Pervanti (2021) analyzed the relationship between army budgets and various indicators like population, rule of law, political stability, and economic growth in selected 27 countries for the period between 2002 and 2018. Using Panel Data Analyses they found that, since it has low defense spending to GDP ratio, army budgets, and spending does not affect economic growth dramatically.

According to researches summarized on the top, military expenditures economic growth nexus was always debatable and inconclusive. As a summary of these works, of course directing the expenditures to productive sectors like infrastructure, education, health and technology is more effective for countries to accelerate economic growth under normal circumstances. However, these 'normal circumstances' issue is not same for all countries. Because all countries have different social, geographical and economic conditions. In addition, closeness to conflict zones, development level of countries and some other crucial factors also are very important to determinate the level of military expenditures. So, despite rising military expenditures effected economic growth and other macroeconomic indicators positively in some period of time in some countries, mostly these expenditures caused to decrease in economic growth and effected macroeconomic indicators negatively in most of countries.

In addition, these pure public military expenditures may affect economic growth and other crucial indicators affirmatively through some productive channels. We can sort these productive channels under four main titles. Firstly, they may trigger demand and this demand may cause to a ‘Keynesian Effect’ in the economy. Also, if the countries could constitute a developed a high technology military industry, they can start to export their military products to other countries. So, this export effect may cause to affect balance of payment positively. On the other hand, if the high military expenditures help the country to get rid of foreign dependency, it may also affect employment positively. A self-sufficient country can get all heavy military industry products from local factories. With the increased high technological factories lots of well-educated labor force may be employed. Thus, military expenditures may affect employment and accordingly economy positively in the countries which are self-sufficient and have export-based high technological defense industry. Finally, with the intense spending to military sector, new and high technology investments may start to increase. These new investments may affect economic growth, employment, GDP Per Capita, Budget Deficit and all other indicators positively. In addition to all these developments for countries, these expenditures may cause to countries be independent and

secured. Because, independency and defense are the main duties of the states. Military expenditures are pure public goods with this specialty. Thus, an independent and secured country may encourage internal and external investments more easily.

FOURTH PART

4. Data and Method

4.1. Dataset

While defining 'military expenditure' here, it is of great importance to distinguish the different conditions of the countries. While using the national budget figures to determine military expenditures in our thesis, the structure of our country has been carefully evaluated. In this context, the expenditures of the National Defense Ministry (land, air, and navy) were taken as the basic military expenditure item. However, our gendarmerie, coast guard and police elements are actively used within the scope of the counter-terrorism operation both inside and outside the country. They take part in many local and international operations, with the special operations units they have. Gendarmerie and police elements are still on duty at many bases and checkpoints in Syria, Qatar, Libya and Iraq. In addition, our police and gendarmerie elements actively participate in peacekeeping operations with UN and NATO. In addition, the armed forces, gendarmerie, coast guard and police elements carry out joint operations within the scope of the fight against terrorism within the country. Also, it is very difficult to separate the costs of elements used only for counter-terrorism and peacekeeping operations in the gendarmerie, coast guard and police forces. In this context, while the national budget figures are used, the expenditures of the Ministry of National Defense (land, air and naval forces), gendarmerie general command, coast guard command and police are taken as basis, while the military investment expenditures of Aselsan, a subsidiary of the Turkish Armed Forces Foundation, are also included in the evaluation.

In the presented study, a 20-year data set covering the period of 2000-2020 was created for Economic Growth (Gross Domestic Product - GDP) and other figures like Gross Domestic Savings, Foreign Trade Balance and Unemployment, which are macroeconomic variables related to economic growth. And military expenditures from two different sources (SIPRI and National Budget Military) were added to this data set. The Turkish Statistical Institute (TUIK), Ministry of Development, Ministry of Trade, Aselsan and Turkish Armed Forces Foundation Annual Reports, and Stockholm International Peace Research Institute (SIPRI) resources were used in compiling the data. All data are % change. The collected data were analyzed using the Eviews 11 software program. Information about the variables used in the analysis is presented in Table 10 below.

Variables	Explanation	Sources	Codes
Economic Growth (Gross Domestic Product – GDP)	% Change	TSI (TURKISH STANDARDIZATION INSTITUTE)	GDP
Gross Domestic Savings	% Change	Ministry of Development	GDS
Balance of Trade	% Change	Ministry of Trade	BOT
Unemployment	% Change	TSI	EMP
National Budget Military Expenditures	% Change (Central Administration Budget Law Investment and Current Expenditures)	Central Administration Budget Law	NBME
Defense Expenditures	% Change	SIPRI	SIPRI

Table 10: Variables Used in Research

As can be seen in Table 10, all variables were taken as percentages and analyzed. The first of the data used in the study is GDP growth. Economic growth is an increase in the production of goods and services in an economy. Increases in capital goods, labor, technology, and human capital support the rate of increase in economic growth. In order for economic growth to take place in real terms, increases should occur not in prices but in the number of goods and services. The basic conditions for achieving sustainable growth can be listed as follows: technological change and development, investments in labor capital, and other capital investments (Deger, 1986). Turkey's growth figures for the years 2000-2020 are shown below.

Economic Growth			
Years	**GDP**	**Years**	**GDP**
2000	6.80%	2011	8.50%
2001	-5.70%	2012	2.20%
2002	6.40%	2013	4.00%
2003	5.60%	2014	2.60%
2004	9.40%	2015	4.00%
2005	8.40%	2016	2.90%
2006	6.90%	2017	7.40%
2007	5.00%	2018	2.60%
2008	1.10%	2019	0.90%
2009	-4.7%	2020	1.8%
2010	8.9%		

Table 11: Economic Growth Rates

Source: TUIK, 2020

Besides economic growth, gross domestic savings, the balance of trade, and the unemployment rate are other macroeconomic indicators that are closely related the economic growth. Therefore, the relation between military expenditures and gross domestic savings, the balance of trade, and the unemployment rate have also been analyzed.

The second data used in the study is Gross Domestic Savings Rates. One of the critical factors affecting the growth potential of the country is the savings rate. Considering that the funds saved are used to finance investments, it can be clearly said that there is a positive relationship between savings, investment, and growth. A stable and stimulating economic environment is essential to increase savings rates. Turkey's saving figures for the years 2000-2020 are shown below.

Gross Domestic Saving			
Years	**GDS**	**Years**	**GDS**
2000	18.40%	2011	14.40%

2001	18.40%	2012	14.50%
2002	18.60%	2013	13.30%
2003	15.50%	2014	14.90%
2004	16.00%	2015	14.60%
2005	15.90%	2016	24.50%
2006	16.60%	2017	15.10%
2007	15.50%	2018	13.90%
2008	16.80%	2019	13.40%
2009	13.20%	2020	20.20%
2010	13.90%		

Table 12: Gross Domestic Saving

Source: Ministry of Development, 2020

Foreign trade, which can be defined as all goods and services transfers between countries, is interpreted through two basic variables, namely exports and imports. A foreign trade deficit occurs when the import figures remain above the export figures in foreign-dependent countries. The resulting foreign trade deficit may have negative consequences on the economic growth. The increasing foreign trade deficit may cause the currency to depreciate and therefore the cost of imported goods to increase and inflation. Turkey's trade balance figures for the years 2000-2020 are shown below in terms of trade deficit.

Balance of Trade			
Years	**BOT**	**Years**	**BOT**
2000	50.96%	2011	56.01%
2001	75.69%	2012	64.45%
2002	69.94%	2013	61.91%
2003	68.15%	2014	66.30%
2004	64.76%	2015	70.68%
2005	62.92%	2016	73.82%
2006	61.28%	2017	68.91%

2007	63.08%	2018	76.65%
2008	65.37%	2019	85.97%
2009	72.48%	2020	79.60%
2010	61.38%		

Table 13: Balance of Trade

Source: Ministry of Trade, 2020

The next variable used in the study is unemployment rates. A person to be defined as unemployed must be unemployed and actively seeking work. The unemployment rate, defined as the percentage of unemployed individuals in the workforce, is considered one of the practical indicators of economic growth. Turkey's unemployment figures for the years 2000-2020 are shown below.

Unemployment Rate			
Years	**EMP**	**Years**	**EMP**
2000	6.50%	2011	9.8%
2001	8.40%	2012	9.2%
2002	10.4%	2013	9.7%
2003	10.5%	2014	9.9%
2004	10.8%	2015	10.3%
2005	10.6%	2016	10.9%
2006	10.2%	2017	10.9%
2007	10.3%	2018	11%
2008	11.0%	2019	13.4%
2009	14.0%	2020	13.2%
2010	11.9%		

Table 14: Unemployment Rate

Source : TUIK, 2020

The last variable used in the study is defense expenditures. First, the data obtained from the SIPRI source, then the data obtained from the Central Government Budget Law and ASELSEN annual reports were used as military expenditure data. For the data compiled from the Central Government Budget Source, the budget data of the Ministry of National Defense, the Gendarmerie General Command, the Coast Guard Command, the Turkish Police and the Defense Industry Presidency are taken as a basis. In addition to these data, ASELSAN budget data is also included in the evaluation, especially in terms of military investment. SIPRI uses UN, NATO, IMF and some other statistical institutions as data sources. In addition, military aid, figures spent on foreign bases, and retired military personnel salaries are also data sources for SIPRI. Turkey's military expenditure figures for the years 2000-2020 are shown below.

Defense Expenditure			
Years	**SIPRI**	**Years**	**SIPRI**
2000	3.66%	2011	2.04%
2001	3.60%	2012	2.02%
2002	3.80%	2013	1.94%
2003	3.30%	2014	1.88%
2004	2.70%	2015	1.82%
2005	2.41%	2016	2.06%
2006	2.36%	2017	2.07%
2007	2.22%	2018	2.55%
2008	2.20%	2019	2.72%
2009	2.49%	2020	2.40%
2010	2.29%		

Table 15: Defense Expenditure

Source: Sipri, 2020

Defense Expenditure			
Years	**NBME**	**Years**	**NBME**

2000	4.38%	2011	2.48%
2001	4.20%	2012	2.46%
2002	3.49%	2013	2.49%
2003	3.44%	2014	2.43%
2004	3.14%	2015	2.28%
2005	2.81%	2016	2.47%
2006	2.62%	2017	2.33%
2007	2.70%	2018	2.70%
2008	2.53%	2019	2.92%
2009	3.36%	2020	3.49%
2010	3.04%		

Table 16: Defense Expenditure

Source : Central Government Budget, 2020

4.2. Method

In the presented thesis, the relationship between defense expenditures and economic growth and other macroeconomic variables related to economic growth are examined. Since this relationship was made for a certain time period, time series analysis has been used to investigate the relation between military expenditures and economic growth in Turkey. Since econometric analysis with non-stationary series results in spurious regression, the first step is to determine whether the data is stationary or not. For this reason, extended Dickey-Fuller (ADF) and Philips-Perron (PP) stationary tests, were performed. Then, Granger causality analysis was applied to reveal the relationship between military expenditures and economic variables.

ADF Unit Root Test

Since the data used in the analysis of time series represent a certain time, the variables are likely to contain unit-roots. Therefore, whether the series used in the analysis are stationary or not was investigated by the extended Dickey-Fuller (ADF) test (Mushtaq, 2011).

Standard Augmented Dickey-Fuller (ADF) test is one of the frequently preferred unit root tests. The regression formulas for the ADF test, in which the lags of the dependent variable are added to the equation to solve the autocorrelation problem, are given in the equations below (Uğurlu, 2009).

1. Unfixed and Trendless Model

$$\Delta Y_t = pY_{t-1} + b - 1\Delta(t-1) + \cdots .. + b_{k-1}\,\Delta(t-k-1) + \varepsilon_t$$

2. Fixed and Trendless Model

$$\Delta Y_t = \alpha_0 \; + + b - 1\Delta(t-1) + \cdots .. + b_{k-1}\,\Delta(t-k-1) + \varepsilon_t$$

3. Fixed and Trend Model

$$\Delta Y_t = \alpha_0 \; + \beta_t + \; + b - 1\Delta(t-1) + \cdots .. + b_{k-1}\,\Delta(t-k-1) + \varepsilon_t$$

In the formulas, k is the number of lags. In this context, the hypotheses established for the ADF test are;

$H_0: p = 0$	There is no stationarity in the series and there are unit roots in the series.
$H_a: p < 0$	Series are stationary and have no unit root.

Dickey and Fuller (1979; 1981) have three alternative models to reveal whether the time series is stationary. To solve the possible autocorrelation problem in the ADF test, the lagged values of the dependent variable are added to the right side of the equation as the explanatory variable (Yamak, 2018: 178). While determining the appropriate delay degree of the lagged variable, delay criteria are used and these delay criteria are explained in detail below.

The hypothesis changes in all three models and they form like $H_0: \delta = 0$ and$H_a: \delta < 0$. The most important difference of the ADF test from other tests is that it covers the lagged values of the variable and the number of lags can be determined.

<u>PP Unit Root Test</u>

After the Dickey and Fuller tests were published, many other tests have been proposed and one of them is the PP unit root test. The PP (1988) statistic is calculated when the dependent variable is in level form, using the same equation features as in the ADF test. Therefore, the H0 hypothesis in the PP test is the assumption that a unit root exists even though the variables are not stationary. The coefficients estimated from the regressions are

modified to obtain Z statistics, and these statistics refer to the ADF critical values. The purpose of the PP test is to remove the finite sample attributes of the ADF test (Wang and Tomek, 2007: 876).

In other words, the PP test is a more comprehensive unit root stationarity theory, and the PP test is similar to the ADF test, but it adds an automatic correction to the ADF procedure to allow for the auto correlated residues procedure, and the PP test generally gives the same results as the ADF tests (Parker, vd. 2006: 605).

Granger Causality Analysis

It is widely known that there may be co-integration relations between economic variables. Engle and Granger (1987) developed a test for the existence of co-integration. Granger causality is a predictive statistical causality concept. (Salman ve Shukur, 2004: 493). In other words, the Granger causality test is defined as a hypothesis test to reveal whether one-time series is useful in estimating another time series. Granger causality analysis is based on two basic principles. These;

- The cause precedes the effect,
- The cause has unique knowledge of the future value of her influence (Bayraktar, 2019: 72)

Considering the two principles regarding causality, the following hypothesis testing equation is used to reveal the causality effect of the X variable on the Y variable..

$$P[Y(t+1) \in A\ I\ I(t)] \neq P[Y(t+1) \in A\ I\ I_{-X}(t)]$$

In the equation, P represents the probability, A is an optionally filled set, I(t) is the knowledge, and t represents the universe.

5. Findings

The study is based on two hypotheses about whether there is a relationship between military expenditures and economic growth. In the findings section of the study, the results of unit root tests (ADF Unit Root Test, PP Unit Root Test) and causality analysis results are given in tables to reveal the relationship between military expenditures and macroeconomic variables. In this context, firstly, The ADF unit root test results for the data are given in Table 17.

	I(0)						
ADF Test Model	**Variables**						
	PP Test	GDP	BOT	GDS	NBME	EMP	SIPRI
Unfixed and Trendless Model	T-statistics (p-value)	-2.69 (0.0098) ***	-0.51 (0.4805)	-1.01 (0.2687)	-0.40 (0.5226)	0.80 (0.8777)	-1.58 (0.1048)
Fixed and Trendless Model	T-statistics (p-value	-4.28 (0.0036) ***	-1.75 (0.3910)	-2.65 (0.0998) *	-3.91 (0.0080) ***	-2.83 (0.0725) *	-2.15 (0.2259)
Fixed and Trend Model	T-statistics (p-value	-4.20 (0.0177) **	-1.45 (0.8103)	-1.09 (0.9054)	-3.70 (0.0460) **	-3.09 (0.1353)	-1.17 (0.8881)
	I (1) (First Degree)						
Model		**Variables**					
	PP Test	d(GDP)	d(BOT)	d(GDS)	d(NBME)	d(EMP)	SIPRI
Unfixed and Trendless Model	T-statistics (p-value)	-4.31 (0.0002) ***	-5.07 (0.0000) ***	-3.60 (0.0011) ***	-5.28 (0.0000) ***	-3.81 (0.0007) ***	-3.13 (0.0035) ***

Fixed and Trendless Model	T-statistics (p-value)	-4.17 (0.0053) ***	-4.97 (0.0009) ***	-3.49 (0.0199) **	-5.06 (0.0010) ***	-3.79 (0.0107) **	-3.20 (0.0360) **
Fixed and Trend Model	T-statistics (p-value)	-4.04 (0.0266) **	-4.63 (0.0089) ***	-4.79 (0.0061) ***	-5.06 (0.0045) ***	-3.67 (0.0501) *	-3.61 (0.0557) *

Table 17: ADF Unit Root Test Outputs

***p value between 0,01 and 0,05;** There is a statistically significant difference. (Significant at the 10% level)*

****p value between 0,001 and 0,01;** There is a high level of significant difference. (Significant at the 5% level)*

*****if p value lower 0,001;** There is a very high level of statistically significant difference. (Significant at the 1% level)*

Table 17 shows the ADF unit root test findings. While the variables were not stationary in all model variants at the I(0) level, when the first differences of the variables were taken, the data became stationary in all models. That is, the variables became stationary at the 1st difference and therefore the first differences of the variables were taken. As a result of both tests, the variables became stationary and the null hypothesis H0, which argued that the variables contain unit root, was rejected. The PP unit root test results of the variables within the scope of the study are presented in Table 18 below.

	I(0)						
PP Test Model	**Variables**						
	PP Test	GSYİH	DTD	GSYT	MBAY	İŞS	SIPRI
Unfixed and Trendless Model	T-statistics (p-value)	-2.67 (0.0102) **	-0.40 (0.5253)	-1.00 (0.2727)	-0.00 (0.6694)	0.79 (0.8772)	-1.58 (0.1048)

Fixed and Trendless Model	T-statistics (p-value)	-4.28 (0.0036) ***	-1.66 (0.4337)	-2.65 (0.0998) *	-3.87 (0.0087) ***	-2.79 (0.0766) *	-2.14 (0.2303)
Fixed and Trend Model	T-statistics (p-value)	-4.20 (0.0179) **	-1.28 (0.8623)	-0.93 (0.9316)	-3.64 (0.0517) *	-2.84 (0.1981)	-0.97 (0.9249)
	I (1) (First Degree)						
Model	**Variables**						
	PP Test	d(GSYİH)	d(DTD)	d(GSYT)	d(MBAY)	d(İŞS)	SIPRI
Unfixed and Trendless Model	T-statistics (p-value)	-8.51 (0.0000) ***	-5.12 (0.0000) ***	-3.56 (0.0012) ***	-10.13 (0.0001) ***	-4.00 (0.0004) ***	-3.10 (0.0038) **
Fixed and Trendless Model	T-statistics (p-value)	-8.22 (0.0000) ***	-5.04 (0.0008) ***	-3.49 (0.0199) **	-9.72 (0.0000) ***	-4.02 (0.0067) ***	-3.17 (0.0379) **
Fixed and Trend Model	T-statistics (p-value)	-9.80 (0.0000) ***	-12.05 (0.0000) ***	-4.80 (0.0059) ***	-15.12 (0.0001) ***	-3.81 (0.0384) **	-4.08 (0.0236) **

Table 18: PP Unit Root Test Outputs

***p value between 0,01 and 0,05;** There is a statistically significant difference. (Significant at the 10% level)*

****p value between 0,001 and 0,01;** There is a high level of significant difference. (Significant at the 5% level)*

*****if p value lower 0,001;** There is a very high level of statistically significant difference. (Significant at the 1% level)*

In Table 18, while all the data are not stationary at the PP test I(0) level, when the first difference of the data is taken, it is seen that all the data are stationary in all models in I(1) level. That is, the H0 hypothesis is rejected, the H1 hypothesis is accepted. In other words, the series became stationary.

It is very important to determine the appropriate lag length to reliably control co-integration between variables. For this purpose, Akaike Information Criteria (AIC), Hannan Quinn Information Criteria (HQIC) and Schwarz Bayesian Criteria (SBC) were used. Lag selection criteria are presented in Table below.

Lag	LogL	LR	FPE	AIC	SBC	HQIC
0	-212.2540	NA*	382.7683*	22.97411	23.27235*	23.02458*
1	-175.8003	46.04688	453.5776	22.92634*	25.01405	23.27967

Table 19: Lag Selection Criteria

** shows the delay order selected by the criterion*

Not: LR: *Sequential Modification LR Test Statistics (Every Test at %5 Level);*

FPE: *Last T Error;*

AIC: *Akaike Data Criteria;*

SBC: *Schwarz Data Criteria;*

HQIC: *Hannan-Quinn Data Criteria.*

According to Table, the appropriate lag length to be used to test the co-integration has been chosen as VAR=0. That is, the VAR model was set up and the appropriate lag length was found to be 0. Although the co-integration analysis gives information about the long-

term relationship between the variables, it does not provide information about the direction of the relationship between the variables. Granger causality analysis should be done within the causality relationship of the variables. The granger causal relationship between military expenditures and economic growth (GDP) is given in Table below.

Dependent Variable	Independent Variable	Chi-square	Degree of Freedom	Possibility Value (p)
GDP	**Military Expenditures (SIPRI)**	4.2120	1	**0.0407**
Military Expenditures (SIPRI)	**GDP**	3.7582	1	**0.0427**

Table 20: Causality Relationship between Military Expenditures (SIPRI) and Economic Growth (GDP)

In Table, there is a bidirectional causality relationship between military expenditures and economic growth because in both cases, since the p probability value is less than 0.05, it is understood that there is bidirectional granger causality between these two variables. In other words, the increase in economic growth positively affects military expenditures. Similarly, an increase in military spending positively affects economic growth. The fact that military expenditures have export-enhancing and employment-provoking features in the field of innovative military technology are decisive factors in terms of increasing economic growth. The causality relationship between military expenditures and foreign trade balance is presented in Table 21.

Dependent Variable	Independent Variable	Chi-square	Degree of Freedom	Possibility Value (p)
BOT	**Military Expenditures (SIPRI)**	1.3745	1	0.5029

Military Expenditures (SIPRI)	**BOT**	2.3023	1	0.2163

Table 21: Causality Relationship between Military Expenditures (SIPRI) and Balance of Trade (BOT)

According to Table, no causal relationship was found between military expenditures and foreign trade balance. Military expenditures have no effect on foreign trade balance and foreign trade balance has no effect on military expenditures. The causal relationship results between gross domestic savings and military expenditures are shown in Table 22.

Dependent Variable	Independent Variable	Chi-square	Degree of Freedom	Possibility Value (p)
GDS	**Military Expenditures (SIPRI)**	17.917	1	**0.0001**
Military Expenditures (SIPRI)	**GDS**	1.9981	1	0.2682

Table 22: Causality Relationship between Military Expenditures (SIPRI) and Gross Domestic Savings (GDS)

Table 22 shows the causal relationship between military expenditures and gross domestic savings. It is seen that there is a one-way relationship between these two variables. This relationship is from gross domestic savings to military spending because the p probability value was found to be 0.001. With the support of Gross Domestic Savings, defense expenditures are inevitable for countries to maintain their independence. The causal

relationship results between unemployment and military expenditures are also shown in Table 23.

Dependent Variable	Independent Variable	Chi-square	Degree of Freedom	Possibility Value (p)
EMP	**Military Expenditures (SIPRI)**	2.7960	1	0.1471
Military Expenditures (SIPRI)	**EMP**	1.0092	1	0.6037

Table 23: Causality Relationship between Military Expenditures (SIPRI) and Unemployment (EMP)

As can be seen in Table, no causal relationship was found between unemployment and military expenditures. Because the p probability value is greater than 0.05. This means that military expenditures do not have an increasing or decreasing effect on unemployment. Similarly, military expenditures are not affected by the low or high unemployment rate.

In addition, the causal relationship between the National Budget Military Expenditures and the macroeconomic variables discussed within the scope of the study was examined by considering the National Budget Military Expenditures instead of SIPRI as a military expenditure item. In this context, the results of the Granger causality relationship between national budget military expenditures and economic growth are presented in Table 24.

Dependent Variable	Independent Variable	Chi-square	Degree of Freedom	Possibility Value (p)
GDP	**Military Expenditures (NBME)**	3.8675	1	**0.0446**
Military Expenditures (MBAH)	**GDP**	0.7709	1	0.6801

Table 24: Causality Relationship between National Budget Military Expenditures (NBME) and Economic Growth (GDP)

Table 24 shows the causality relationship between national budget military expenditures and economic growth. There is a one-way causality relationship between national budget military expenditures and economic growth, and this causality runs from economic growth to national budget military expenditures because the p probability value is less than 0.05. In other words, there is no causal relationship from national budget military expenditures to economic growth. This result is different from SIPRI defense spending. While there is a two-way relationship when SIPRI is made by considering defense expenditures, a one-way relationship is found when national budget military expenditures are taken into account. The reason for this can be evaluated as SIPRI's use of resources other than the Central Government Budget Law to determine the amount of military expenditures. The causality relationship between the national budget military expenditures and the foreign trade balance is presented in Table 25.

Dependent Variable	Independent Variable	Chi-square	Degree of Freedom	Possibility Value (p)

BOT	**Military Expenditures (NBME)**	1.1938	1	0.4505
Military Expenditures (NBME)	**BOT**	3.3757	1	0.0749

Table 25: Causality Relationship between National Budget Military Expenditures (NBME) and Balance of Trade (BOT)

According to Table 25, no causality was found between the foreign trade balance and the national budget military expenditures. The increase or decrease in these two variables does not affect each other, and this result is the same as the Granger analysis results based on SIPRI data. The causality relationship results between gross domestic savings and national budget military expenditures are shown in Table 26.

Dependent Variable	Independent Variable	Chi-square	Degree of Freedom	Possibility Value (p)
GDS	**Military Expenditures (NBME)**	4.4745	1	**0.0268**
Military Expenditures (NBME)	**GDS**	1.5782	1	0.4542

Table 26: Causal Relationship between National Budget Military Expenditures (NBME) and Gross Domestic Savings (GDS)

As seen in table, there is a one-way causality relationship between the national budget military expenditures and the gross domestic savings, and this relationship is from gross domestic savings to national budget military expenditures. This result is the same when SIPRI military expenditures are taken into account. The granger causality relationship results between unemployment and national budget military expenditures are also shown in Table 27.

Dependent Variable	Independent Variable	Chi-square	Degree of Freedom	Possibility Value (p)
EMP	**Military Expenditures (NBME)**	1.5337	1	0.3645
Military Expenditures (NBME)	**EMP**	0.2877	1	0.8660

Table 27: Causality Relationship between National Budget Military Expenditures (NBME) and Unemployment (EMP)

Table 27 shows the relationship between unemployment and national budget military expenditures, and there is no granger causality between these two variables. This result is the same when SIPRI military expenditures are considered. While unemployment increases or decreases do not affect military expenditures, in the same way, more or less military expenditures have no effect on unemployment.

As a summary, the data were stabilized by performing root analyzes first. Afterward, the causality between military expenditures and economic growth and other macroeconomic variables such as gross domestic savings, foreign trade balance and unemployment was analyzed. Defense expenditures are used in two ways as both SIPRI data and national budget expenditure defense expenditures. The causality relationship between both SIPRI and

national budget defense expenditures data and economic and macroeconomic data was found to be very similar. While there was a bidirectional causality relationship between only SIPRI data and economic growth, a unidirectional relationship was found between national budget defense expenditures and economic growth.

6. Conclusion

Military expenditures must be made in order to create an environment of national freedom and security and to protect the country against internal-external threats, which can lead to the status of an "investible" country in terms of economy. In addition, it is the main effort of countries to gain an economic and political advantage by using the deterrent effect of a strong army. In today's world, the basic condition of having a deterrent army is to be strong in the field of military industry and technology.

Of course, level of security expenditure is necessary for economic activities to continue under a climate of peace. However, there is no common practice across the states regarding the level of the shares allocated for defense from national resources. Because there are many factors that affect the amount of the budget allocated for defense. These factors may force countries to increase the share they allocate for defense from their budgets.

The impact of the budgets allocated for compulsory military expenditures on the economy and their positive and negative externalities have always been discussed throughout history. There is no clear consensus on this subject, which has a large literature. While some studies have concluded that there is a positive relationship between military expenditures and some macroeconomic variables related with economic growth, some have obtained negative results. In fact, according to some results, there is no relationship between them. The scarce resources, technological infrastructures, production capacities, and export visions of the countries constitute the cornerstones of the relationship between military expenditures and some macroeconomic variables related with economic growth.

Turkey is important country due to its deep-rooted history, geographical location, proximity to conflict zones, rich natural resources it has or is close to, qualified workforce, production capacity, and developing technological infrastructure. For this reason, it always continues to maintain its importance due to its critical geopolitical position in the changing and developing world order. In this context, our historical mission to have a strong domestic and national defense industry has started to yield positive results with our increasing domestic defense industry. Both public benefit affiliates such as ASELSAN, ROKETSAN, and HAVELSAN and also private companies that produce domestic and national helicopters, tanks, weapons, and ammunition, especially domestic unmanned aerial vehicles make a great contribution to the economy with its local and qualified workforce in Turkey.

In this study, the relationship between military expenditures and economic growth (also some macroeconomic variables related with economic growth like, gross domestic savings, foreign trade balance, and unemployment) were examined for Turkey. Growth and unemployment data were obtained from the TUIK database, foreign trade balance data from the Ministry of Commerce database, gross domestic savings data from the Ministry of Development database, defense expenditures from SIPRI, Central Government Budget Laws, and annual activity reports of companies.

All data cover the period 2000-2020 and are evaluated in %. In the model, firstly, the stationarity levels of all data were determined. For this purpose, Augmented Dickey-Fuller Test (ADF) and Philips-Perron test were used. As a result of the application of these tests, all the data whose primary differences were taken became stationary. It is very important to determine the appropriate lag length to reliably control co-integration between variables. For this purpose, Akaike Information Criteria (AIC), Hannan Quinn Information Criteria (HQIC), and Schwarz Bayesian Criteria (SBC) were used. As a result of the lag analysis, the appropriate lag length was found to be 0. The co-integration analysis confirmed that there is a long-term relationship between the variables. In order to determine the direction of the relationship between the variables, Granger Causality Analysis was performed.

As a result of the Granger Causality Analysis, a bidirectional relationship was found between the military expenditure data obtained from the SIPRI source and the economic growth figures, and a unidirectional relationship between the gross domestic savings. However, no causal link was found between foreign trade balance and unemployment data and military expenditure data. In the analysis made using the military expenditure data obtained from the Central Government Budget Laws and Aselsan annual reports, results similar to the analysis made using the SIPRI resource were obtained. The only difference is in their relationship to economic growth. While a bidirectional relationship was found between SIPRI resource data and growth, a unidirectional relationship was found between Central Government Budget Laws and data obtained from Aselsan resources and growth.

As stated in the data section, this study is one of the first studies with national budget data. There are differences between the data obtained from the Sipri source and the national budget data. In this context, there are pros and cons of using national budget figures. While Sipri collects data with standard methods for all countries, it is considered that the data obtained by compiling national budget figures cover more realistic results for Turkey.

Because in most of the countries, the gendarmerie and police units only perform public order duties, while in our country they carry out tasks for counter-terrorism. In addition, the technological investment expenditures of Aselsan, which is an element of a foundation working for the benefit of the army, are also specific to our country, in order to improve our military capabilities and capabilities.

The lack of transparency in military expenditures, the existence of secret and covert appropriations, the inability to clearly determine the number of personnel used for defense purposes in the gendarmerie and the police are the main obstacles to a clear determination of military expenditures. In addition, the impact of military expenditures on the economy cannot be seen in a short time. Of course, the developments in the Turkish Defense industry, which has gained great momentum recently, will have a positive effect on economic growth. But it will take time for this effect to occur. Innovative technologies and increasing export potential in the defense industry can be expected to make a positive contribution to the economy in the upcoming period.

Considering the results of the analysis, it is inevitable that Turkey's defense industry, which is strengthened by new investments and technological developments, will bring many positive externalities to the country. The country may gain momentum in economic growth with the innovative technology, export, and employment potential that the defense industry will bring. The increase in domestic production at the level of intermediate goods and final products in the defense industry may also mobilize many sectors that the defense industry is related to. In this context, the foreign trade balance of the country, which reduces its foreign dependency, may also be affected positively.

In the field of the defense industry, where technology creates a multiplier effect, it is of great importance to train the qualified workforce and increase R&D studies. Private investments in this field should be planned, R&D studies should be increased and new projects should be developed to increase the level of technological development with the cooperation of the state-private sector and university.

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