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THE EFFECT OF MILITARY EXPENDITURES ON ECONOMIC GROWTH AND UNEMPLOYMENT: EVIDENCE FROM TURKEY

Askeri Harcamaların Ekonomik Büyüme ve İşsizlik Üzerindeki Etkisi: Türkiye'den Kanıtlar

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ABSTRACT

Nowadays, military expenditures have an important share in public expenditures of countries. Although military expenditures have an important share in public expenditures, it is considered that military expenditures are unproductive in the economic growth and development process. The point in question, increases in military expenditures may cause less spending on economic and social fields. Less resource allocation to economic and social fields affects growth and employment. Thus, in this study, it is aimed to investigate the effect of military spending on economic growth and unemployment in Turkey. A data set which based on the period 1988-2019 was used to examine the relations between variables. According to the findings of Maki (2012) cointegration test, a cointegration relationship was found between military expenditure (ME), economic growth (EG) and unemployment (UNEMP). The FMOLS estimator was used for the estimation of long-term coefficients in the study. According to the results, it has been determined that military expenditures increase economic growth and unemployment in the long-term. This results showed that military expenditure led to growth that not based on employment in Turkey.

Anahtar Kelimeler
Askeri Harcamalar, Ekonomik Büyüme, İşsizlik, Eşbütünleşme Testi

ÖZ

Günümüzde askeri harcamalar, ülkelerin kamu harcamaları içerisinde önemli bir paya sahiptir. Askeri harcamalar, kamu harcamaları içerisinde önemli bir paya sahip olmakla birlikte bu harcamaların ekonomik büyüme ve kalkınma sürecinde verimsiz olduğu kabul edilmektedir. Söz konusu askeri harcamalardaki artışlar, ekonomik ve sosyal nitelikteki alanlara daha az harcama yapılmasına neden olabilmektedir. Ekonomik ve sosyal nitelikteki alanlara daha az kaynak ayrılması ise büyüme ve istihdamı etkilemektedir. Buradan hareketle yapılan bu çalışmada, Türkiye'de askeri harcamaların ekonomik büyüme ve işsizlik üzerindeki etkisinin araştırılması amaçlanmıştır. Değişkenler arasındaki ilişkileri incelemek için 1988-2019 dönemine dayalı bir veri seti kullanılmıştır. Maki (2012) eşbütünleşme testinin bulgularına göre askeri harcamalar, ekonomik büyüme ve işsizlik arasında eşbütünleşme ilişkisi bulunmuştur. Çalışmada uzun dönem katsayılarının tahmini için FMOLS tahmincisi kullanılmıştır. Elde edilen sonuçlara göre, askeri harcamaların, uzun vadede ekonomik büyümeyi ve işsizliği artırdığı tespit edilmiştir. Bu sonuçlar, Türkiye'de askeri harcamaların istihdama dayalı olmayan bir büyümeye neden olduğunu göstermiştir.

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1. Introduction

Because of the fact that the different masses of people have been living together since the early ages of history, the division of labor has developed and specialization has been started in society. Within this specialization, the military appeared as a privileged class in the society. The military is an important force in terms of ensuring the security of the society, protection from internal and external threats and continuity of the existing puissances. In general manner, the term can also be expressed in the form of physical power that countries use to achieve their national goals. Today, many civilizations prolong their existence depending on the military forces they hold in the past or present. Therefore, each country allocates some of its budget revenues to military expenditures. The share of these expenditures in the economy varies with regard to the countries and cyclical situation (Durgun and Timur, 2017: 127). But, in this sense, neo-liberal policies are guide of almost all countries about how public sector can operate in more limited function (Demir and Geyik, 2019: 59).

In many countries, the resources allocated for military expenditures constituting a significant proportion of both total public spending and GDP are withdrawn from alternative areas of use that may be extremely important for growth. When viewed from this aspect, it can be said that ME are carried out at the cost of neglecting activities that accelerate the EG and development of the country. On the other hand, defense is an indispensable service in protecting the existence and independence of the country. Indeed, Adam Smith's statement that "Defense is more important than prosperity" supports this view (Giray, 2004: 189).

Advocates of ME tackle it not only based on national security and steadiness, but also in an economic context. In this sense, if aggregate demand is preliminarily lower than potential output, an increase in demand for ME will evoke to reduction in resource costs and more efficient capacity utilization. This will increase the rate of profit and eventually fosters investments, employment and growth (Değer, 1986: 182). Considering that countries around the world form their future plans in line with the aim of growth, it should be noted that the amount of goods and services to be produced in a country is directly related to the inclusion of labor in production process and its adaptation to constantly changing and developing modern production technologies (Bağcı and Börü, 2018: 890-891). Budget allocated for ME and proper and effective use of defense technologies come to the forefront at this point. On the other hand, the expenditures of periods of the war cause unreliable standing of the government in front of the public. Therefore, the value of the money decreases. These results can be accounted one of the disadvantages of ME (Gürsoy and Kartal, 2020: 99).

ME may be a prerequisite for EG if it provides national security. The optimality of ME in a country is important in terms of the development. Because allocating more than adequate resources to defense, hence excessive ME will delay growth. On the other hand, a low level of resource allocation will threaten growth by causing instability or turmoil (Değer and Sen, 1995: 285-297). But even if the optimal level of ME can be determined, it is vital to assess the cost of defense in terms of growth or reductions in current consumption, investment or output. In addition to this, ME create positive external effects especially in the infrastructure, technological development and human capital accumulation areas of the economy. It is required to investigate that how the cost of the change in use occuring by shifting the scarce resources from the areas that don't directly contribute to current consumption, investment and EG will be compensated with positive external benefits (Ram, 1995: 253-254).

ME has different effects on developed and developing nations. Certain approaches are associated with the developing countries. Upswing in ME may keep down UNEMP induced by low level of depletion or underinvestment. Research and development activities in defense industry can positively affect private investments through spin-offs and technology transfer. It can be asserted that ME could facilitate progress social infrastructure and other public-domain goods and servicings. Also, ME might enhance the communal skill set via the instruction of army personnel. ME help create a steady business environment that contributes to the acceleration of foreign investments by enabling surety. Nonetheless, ME cause investments to be withdrawn from private sector and shifted to other areas. Weapon import could adversely affect the balance of payments. Growing tendency to military R&D activities may draw off vital R&D investments from private sector where output could be made use of for more practical purposes. Governments might step up tax rates to finance ME that could restrict EG. It can also utilize resources and technologies used by export industries, resulting in higher EG (Islam, 2015: 58).

In industrialised countries, economic shrinkage in times of peace is observed generally due to the lack of demand. In such periods, ME can stimulate economic activities and thereby cause a revival in production (Eshag, 1983: 87). ME can control overgrowth. ME which is an item of capital budget can be significantly controlled and used for economic stabilization by governments. In short, these expenditures can be increased during the periods of recession, and reduced in the periods of inflationist pressures (Looney, 1997: 381-406).

Although ME are included in the budgets of both developed and developing countries as an important component of public expenditures, these are usually not accepted as productive. Therefore, the expenditures made in defense industry may cause the decrease of other expenditures that expand the volume of output and investment. This inevitably affects economic growth and unemployment. Even if ME has the potential to increase EG, it is likely to reduce employment. The use of capital intensive technologies, the increase in demand for a well-educated, highly skilled workforce in defense sector exclude unqualified labor from the labor market, resulting in an increase in UNEMP particularly due to the growth in total factor productivity by technology. Hence, the idea that ME may have different effects on EG and UNEMP constitutes the starting point of our study. In this study, the relevance of ME, EG and UNEMP is tried to be determined for Turkey over the period 1988-2019 with time series analysis. Within this framework, at first, theoretical approaches that explain the impact of ME on EG and UNEMP are mentioned. Afterward, some previous studies on the subject and their results are given. Then the empirical model used in the study is acquainted and findings obtained by the analysis are presented. Finally the outcomes of the analysis are evaluated as a whole and some policy recommendations of empirical findings are made.

2. Theoretical Framework

Determining the feasible effects of ME on EG actually means to explain through which channels these effects are coming from. However, there is no sole theoretical explanation that predicates through which channels ME affect the EG and is agreed upon (Topal, 2018b: 177). Policy makers who favor EG and welfare economists argue that the growth in ME should be less than the growth of nonmilitary expenditures. Over against, some other experts affirm that ME have positive external benefits that increase output in the economy. Counter-views such like make the theories association between ME and EG subject to discrepancies (Islam, 2015: 57).

Military Keynesianism Approach says that ME can be considered as a constituent of government expenditures. Therefore, the state can step in the market when total demand is weak. In case of a rise in ME, the capacity utilization will ameliorate, thus the aggregate demand and the level of output and employment will bid up through multiplier effect. Consequently, the return of capital, investments and growth increase (Looney, 1994: 46-47). In the light of this approach, Military Keynesian theory lets on the effects of ME on EG by focalising the positive externalities that these expenditures cause in the economy. In this respect, the theory provides a supply-side explanation to the subject.

Positive externalities that ME disperse to the economy increase total factor productivity. These externalities include factors such as training of military personnel, the infrastructure formation and technical methods augmenting through military R&D, the supports that the army provides to internal security services as well as modernisation, stability and discipline. In particular, all citizens living in the country can benefit from the innovations discovered during the R&D activities carried out in the military field. In fact, almost all of the inventions in the fields of electronics (e.g. computer, internet, fax, etc.) and transportation (e.g. airways, communication webs, dams, roadways and so on) was conducted for the first time due to military reasons (Giray, 2004: 189; Durgun and Timur, 2017: 130). Communication devices like smartphones and aviation tools which are widely used today are the outcome of developments in the information sector and defense industry. This existing technology will enable social and economic activities to take place easily, and will also speed up the production of goods and services, thus generate a positive impact on growth. At that, infrastructural investments will give rise to accretions on education, health and human capital. Thereby, the productivity of endproduct will increase and so it positively affects EG (Uçan, Öztürk and Akyıldız, 2016: 54-55). In addition to these, a high-tech and factor-efficient defense sector will have significant effects especially on the manufacturing industry. Notably, technological innovations stemming from the production of advanced weapons will lead to increases in inter-industry links through the feedback. Positive externalities both spark off productivity growth and positively influence the GDP by causing the nascence of new branch of industries, creation of new employment areas and so the increase in the level of domestic income (Künü, 2013: 71).

On the other hand, Neo-Classical Theoretical Approach focuses on the negative externalities of ME and explores the link between the variables by demand-side factors. Import of some military weapons from abroad may narrow scarce foreign exchange resources of developing countries (Eshag, 1983: 87). The employment of qualified workforce like experts, scientists, engineers and demand for high-skilled labor in defense industry will reduce human capital supply in other sectors of the economy (Değer and Sen, 1995: 296). As the R&D expenditures which are in the group of ME and have a positive contribution to productivity produce negative effects on civil expenditures (resources allocated to civil projects are reduced), EG may be adversely affected.

This situation is based on the view that military technology has lower rantability than civilian technology (Cappelen, Gleditsch and Bjerkholt, 1984: 372).

In the Neo-Classical Model, the government is seen as a rational actor who balances the security benefits and opportunity costs of ME in order to maximise a clearly defined national interest reflected in a societal welfare function. This approach accepts ME as a pure public good and suggests that the net economic effects of ME are determined by alternative costs. Nominately, it measures the economic impact of ME by comparing opportunity costs between military expenditures and other expenditures. According to this model, ME that impairs efficiency in resource allocation is the result of technological changes, cost increases and armament race (Topal, 2018b: 177-178).

The financing of ME with taxes may disrupt the tax structure of the economy and reduces the amount of consumption and investment. As a result; the output, employment and growth rate will decrease. This fall or slowdown in growth has to be balanced with benefits that the defense can create on growth. Reducing ME will create budget savings, and the use of these savings for health and education expenditures or incidence of them to citizens in the form of a lower tax rate will raise EG (Giray, 2004: 191).

Briefly, in compliance with the Neo-Classical Approach, ME can bring along a high opportunity cost by moving away scarce resources from directly productive investments (e.g. development projects with high growth rates) and human capital accumulation. This case not only lowers nonmilitary public expenditures, but also interrelating private sector expenditures (Looney, 1994: 36). Accordingly, the disarmament is seen as the main factor of development. Indeed, it is argued that one of the most important reasons for the decrease in productivity of the USA economy comparing with Japan is the high burden of ME (Fontanel, 1995: 572).

Another view that ME negatively affect EG comes from the theorists of institutional economics. Institutionalist Approach mostly focuses on the negative effects of ME, considering that government intervention is not a forcible solution for the economy. According to an institutionalist view, ME lead to industrial inefficiency. Advocates of this view, in the context of the Military Industrial Complex, discuss how interest groups in the form of an individual, firm or organisation trying to gain expedience from ME develop. This notion submits that conflicts of interest will spoil the rational allocation of resources in the economy even though it admits that national interests are preserved at a certain level. Once for all, ME is considered as the type of expenditure that increases fiscal burden and creates exclusionary effects for civil sectors. Another institutionalist criticism for military disbursement comes from the Austrian School of Economics. The members of this school put forth that high ME is a product of statist and collectivist understanding and such expense is a reason for wars and long-term economic devastation (Topal, 2018b: 177-178).

The connection between ME and EG is also evaluated in the context of Marxist economics. In the Marxist Approach, ME are generally presumed fructuous for the continuity of the capitalist system. Marxist Theory sees ME as a means of capitalist development and evaluates the role of Military Industrial Structure in the class war. According to Baran and Sweezy (1966), ME play an important role in overcoming realised crises involving the protection of income by absorbing the excess capacity without increasing labor wages. But Marxist writers also point out that it is a public measure that feeds the contradictions of the capitalist system due to the opposing effects of military expenditures. ME can contribute to the increase of the rate of exploitation in the economy by suppressing labor wages of monopolistic production units. Thus, the fall of the profit rates in the economy is prevented. Also higher ME can redound the postponing of recession by creating substitute demand and making the assessment of monopolistic profits more realistically even if it doesn't increase per capita output in the economy. By contrast with, ME could bring on the slump in labor income and contraction in demand. When evaluated in the context of Marxist theories of profit, ME are reckoned as a type of outlay that slows down the increase in organic compound of capital by changing the structure of capital accumulation, calls forth monopolization of capital by causing high R&D expenditures, boosts added value by leading up the fall of fixed capital (as cited in Baran and Sweezy (1966), Dunne, 1996: 446; Topal, 2018b: 178).

As known, UNEMP is one of the macroeconomic indicators commonly used to reflect the EG. Because UNEMP is closely related to EG, and ME affects EG, it may also affect UNEMP (Üçler, 2017: 161). There are different alternative views on how ME affect the level of employment. Conservative view argues that increase in ME would directly reduce UNEMP as sheer number of workers are hired by agminal-connected operations. Also these expenditures may indirectly reduce UNEMP to a great extent with manifold service or supporting roles. Lliberal view, on the other hand, considers ME as waste, inefficiency, private sector crowding-out and fraud in production. The advocates of this view think that enhanced ME due to the transfer of social budget to defense expenditures will lead to a decrease in employment. Radical approach suggests that large scale ME can pull the economies out of recession. High defense expenditure within the country will increase EG and

thus employment. If the expenditures on military personnel and the maintenance outgoings of the army make up a large part of the ME, an uptick in the ME will increase the aggregate demand and this will increase the employment (Yıldırım and Sezgin, 2003: 130).

Sweezy and Baran's study also comprises findings that support the radical view. According to Sweezy and Baran (1966), ME create employment opportunities and take the capitalist system out of stagnation by stimulating effective demand. They conclude in their study that ME in the USA significantly increase employment. However, contrary to their opinion, there has been an appreciable shift towards labour-saving advanced technology military systems from 1980s. Accordingly, capital intensive weapons are anticipated to generate less employment gains owing to spending on high-tech products (as cited in Baran and Sweezy (1966), Yıldırım and Sezgin, 2003: 130).

ME may affect labor markets through different channels. First, military infrastructure works and improvements in productivity can increase private sector labor demand via technological diffusions. Technological advances in defense industry call forth additions in the human capital stock, thereby increasing employment. Second, the shrinkage in defense industry may lead workers to move from the military sector to the private sector. This situation is called as "Displacement Effect". This effect in the defense industry will create frictional unemployment, hence the labor supply in the private sector will increase. Third, the provision of the necessary resources to finance ME will incur a tax burden on labourers and employers and this will affect both labor supply and labor demand. If the tax burden is on the employer, the demand for labor will decrease; if on the workers, the labor supply will decrease. Also, such tax burdens can negatively affect employment in the country by leading to public inefficiency or corruption. And fourth one, stabilising and countercyclical effects of military expenditures. ME can increase or decrease UNEMP in the economy depending on how these effects work. However, these alternative channels don't give any precise information about the direction of the effects of ME on UNEMP rates. Therefore, nothing can be said about how UNEMP will respond to changes in ME in view of the positive and negative effects of ME together (Aydemir, Özdemir, Kabadayı and Emsen, 2016: 438; Üçler, 2017: 161; Topal, 2018a: 142).

3. Literature Review

Investigations in academic literature generally focus on the effects of ME on either EG only or UNEMP. However, in this study, UNEMP and EG variables are considered together. Within this scope, whether ME increase EG through multiplier mechanism and the impact of the relevant expenditures on UNEMP are investigated. So in case ME cause EG, it is tried to be revealed whether it is based on employment or not. The contribution of our study to the literature will be in this direction.

The first study to test the relationship between ME and EG was done by Emile Benoit in 1973. Benoit first touched upon the link between EG and ME in his book titled "Defense and Economic Growth in Developing Countries" published in 1973, and later in his article "Growth and Defense in Developing Countries", which he prepared in the same book in 1978. Benoit (1973, 1978) states that there is a positive relationship from ME to growth rates in developing countries.

Benoit (1978) utters that ME has three positive effects on economies. Firstly, military service allows a country's people to acquire modern skills and behaviors. Secondly, ME such as roads, bridges and airports also contribute to the development of economic infrastructure of the country since they have alternative civilian areas of use. Thirdly, ME lead to a moderate inflation that promotes full or almost entire use of the available production capacity. Concisely, Benoit (1978) says that the favorable effects of ME on the economy are more than the adverse effects. The results, in fact, seem to be far from presenting a consensus when the related literature is evaluated collectively.

Benoit (1978), in his study for 44 less developed countries over the period 1950-1965, shows that countries with high military budget often have the fastest growth rate, but countries with the lowest military budget have the minimum rate of growth. These results constitute the mainstay of the Benoit hypothesis. The notional linkage that is thought of sensible in this research that military operates more efficiently than red tape in unmilitary well being activities centering upon indigent people. Besides, the deployment of military forces in conflict areas enable reliance for agrarian and nonagrarian production in less developed countries.

According to Benoit (1978), economists claim that ME often reduce resources that are required for investment and thus slow down the growth rate of countries. However, the result reached in the study by Benoit in 1978 was thought to be valid for developed countries but not for underdeveloped countries. Based on this, Lim (1983) argued that Benoit's work doesn't yield distinct results, so he retested the relationship between ME and

EG for 54 less developed countries. According to the result of Least Squares Method, a reverse relation between ME and EG has been found. Because these two pioneering works earn a different perspective on the subject, many empirical studies criticising or supporting Benoit's approach have been done in the literature to establish the link between the variables. But the results derived from these works could be different. When the subject is theoretically tackled, the investigations fulfilled don't submit a lucid compromise about the influence of ME on EG.

The literature summary on the connection of ME and EG is presented in Table 1 in chronological order in the context of the period, sample, method applied and the results achieved.

Table 1. Studies on the Relations Between ME and EG

Researcher	Period/Country/Method	Findings
Değer and Smith (1983)	1965-1973, 50 Less Developed Countries, OLS	ME adversely affect EG.
Payne and Ross (1992)	1960-1988, USA, Vector Autoregression Analysis	No causal relevancy between the economic performance and ME.
Dunne, Nikolaidou and Vougas (2001)	1960-1996, Greece and Turkey, Granger Causality Test	Causality relationship between ME and real GDP is positive for Greece, but negative for Turkey.
Hou and Chen (2013)	1975-2009, 35 Developing Countries, GMM Method	ME negatively impact EG.
Destek and Okumuş (2016)	1990-2013, BRICS and MIST Countries, Panel Bootstrap Granger Causality Analysis	ME has a positive impact on EG in China, but negative impact in Turkey.
Korkmaz and Bilgin (2017)	1961-2015, USA and Turkey, Johansen Cointegration and Granger Causality	No causal relationship between ME and EG for the USA, but a long-term causality has been seen between two variables for Turkey.
Topal (2018b)	1960-2016, Turkey, Cointegration and Causality Analysis	ME negatively impact long-term per capita output.
Raju and Ahmed (2019)	1989-2017, China, India and Pakistan, Cointegration and Causality Analysis	ME positively impact EG in the long-term.
Lobont, Glont, Badea and Vatavu (2019)	1991-2016, Romania, Granger Causality Analysis	Positive association between ME and EG in the long-term.
Ologbenla (2020)	1980-2017, Nigeria, VAR Model	ME don't significantly contribute to GDP.
Rehman (2020)	1961-2018, Pakistan, ARDL Approach	ME positively affect EG.
Laniran and Ajala (2021)	1981-2017, Nigeria, ARDL Approach	Inverse relation in the short-term, but positive relation in the long-term between ME and EG.
Topal, Unver and Turedi (2021)	1960-2019 and 1996-2019, 27 NATO Countries, Panel Bootstrap Granger Causality Analysis	Symmetric and asymmetric causal relationships between ME and EG, that differ from country to country.
Nugroho and Purwanti (2021)	2002-2018, 27 Lower-Middle Income Countries, GMM Method	ME alone don't have an impact on EG. But it creates a positive and significant effect on EG when interacting with variables such as the population and rule of law. Meantime, it affects EG negatively when interacting with foreign direct investment and political stability variables.

Principally, EG increases the need for labor. Namely it is anticipated that developments in the economy will absorb surpluses in the labor supply and thus lower UNEMP rates. Increase in ME may positively affect the level of investment, output and employment through the multiplier mechanism. Although the view that the increase in ME can reduce UNEMP by absorbing idle labor can be proved theoretically, it is also found empirically that these expenditures can increase UNEMP (Qiong and Junhua, 2015: 499). Because the relationship between EG and employment is not completely flawless in every case and country, the researchers also try to analyse the effects of ME on the labor market. Explaining the ME-UNEMP association actually means to reveal that through which channels ME affect the labor market (Topal, 2018a: 141-142). In addition, there will be reverse causation in the case that UNEMP is the determinant of ME besides the positive and negative effects of ME on UNEMP (Aydemir et al., 2016: 438).

The table below presents the results of the studies on the relationship between UNEMP and ME.

Tablo 2. Studies on the Relations Between ME and UNEMP

Researcher	Period/Country/Method	Findings
Chester (1978)	1960-1980, 9 Countries, Data of Unemployment	No nexus between ME and UNEMP rate.
Barker, Dunne and Smith (1991)	1992-2000, United Kingdom, Simulation Analysis	Cuts in ME lead to a significant decrease in UNEMP.
Dunne and Watson (2000)	1961-1991, South Africa, ARDL Approach	ME increase employment in the short-term, reduce it in the long-term.
Yıldırım and Sezgin (2003)	1950-1997, Turkey, ARDL Approach	ME negatively influence employment in both short and long-term.
Huang and Kao (2005)	1966-2002, Taiwan, ARDL Approach	ME negatively affect employment growth in the short-term and positively in the long-term.
Qiong and Junhua (2015)	1991-2013, China, ARDL Approach	ME positively influence UNEMP.
Zhong, Chang, Tang and Wolde-Rufael (2015)	1988-2012, G7 Countries, Bootstrap Panel Granger Causality Test	No evidence of causality between ME and UNEMP.
Üçler (2017)	1980-2014, Turkey, DOLS Test	Increase in the burden of ME reduces UNEMP.
Topal (2018a)	1955-2016, Turkey, Cointegration and Causality Test	No nexus between ME and UNEMP.
Onuoha and Agbede (2019)	2000-2017, 20 African Countries, GMM Method	Positive link between ME and UNEMP.
Canbay and Mercan (2020)	1988-2017, Turkey, ARDL Approach	No relationship between ME and UNEMP rate in the short-term, but ME negatively affect the UNEMP in the long-term.
Erdugan and Özçelik (2020)	1993-2017, 28 EU Countries and Turkey, Panel Data Analysis	Increase in ME rises UNEMP.
Becker (2021)	1991-2019, NATO and EU Countries, Panel Data Analysis	Governments have slightly reduced high-level defense spending in response to unemployment.

4. Econometric Analysis

4.1. Dataset

The data that was used in the study on the basis of the period of 1988-2019 in order to analyse the impact of military expenditures (ME) on economic growth (EG) and unemployment (UNEMP) in Turkey are presented in the following table.

Table 3. Data Used in Analysis

Data Abbreviation	Unit	Source
Military Expenditures (ME)	Billion Dollar ($)	Stockholm International Peace Research Institute
Economic Growth (EG)	Billion Dollar ($)	World Bank, World Development Indicators (2020)
Unemployment (UNEMP)	Number of Unemployed	Turkish Statistical Institute

All series used in the study were subjected to logarithmic transformation and analyses were made accordingly. In this way, it was aimed to eliminate the outliers in the series and reduce the risk of encountering heteroscedasticity problem as a result of the analyses. The data of military expenditures, economic growth and unemployment used in the study consisted of annual data. The military expenditures data were derived from the NATO's definition, which includes all current and capital expenditures made by the armed forces, including the peace force. To expand this definition, military expenditures data include military and civil personnel, including retirement pensions of military personnel and social services for personnel; operation and maintenance; procurement; and military R&D (The World Bank, 2020). The economic growth shows the annual GDP data calculated at constant prices in $ for 2010. The unemployment variable shows the annually announced number of unemployed people.

4.2. Methodology

In this study, stationarity orders of relevant variables were attempted to be determined first in order to analyse the effects of military expenditures on economic growth and unemployment in Turkey between the years of 1988-2019. Dickey-Fuller (1979) (ADF), Phillips-Perron (1988) (PP) and Lumsdaine-Papell (1997) (LP) unit root tests were used for testing the unit root of variables. The cointegration relationship between the series was analysed by Maki (2012) cointegration test with multiple structural breaks. The Fully Modified Ordinary Least Squares (FMOLS) method was used to estimate the long-term cointegration coefficients. In the analysis and findings section of the study, the results of Dickey-Fuller (1979) and Phillips-Perron (1988) unit root tests were provided, but the methodology of these two-unit root tests was not mentioned.

4.2.1. Lumsdaine-Papell Unit Root Test

If there is an event that occurred in the country during the period subject to analysis, such as crisis, natural disaster etc., such event must be taken into consideration in the regression with the dummy variable and break dates must be determined to make sure that the prediction and estimation results are reliable. For this reason, contrary to Perron who assumed the break time as exogenously, Zivot and Andrews developed a new unit root test that allows a predictive break in the trend function and established three models to demonstrate this. These are the Model A which allows for a single break in the level of the trend function, the Model B which allows for a single break in the slope of the trend function, and the Model C which allows for a single break in the level and slope of the trend function of the series (Zivot and Andrews, 1992; Waheed, Alam and Ghauri, 2006: 5-6). However, Lumsdaine and Papell (1997) formulated the models in the unit root test, which were developed by Zivot and Andrews (1992) and allow for a single break, in a way that they allow for two endogenous breaks by arguing that a single break will cause incorrect estimations in case the series analysed are a long term series. Accordingly, Lumsdaine and Papell (1997) created the Model AA, which allows for two breaks in the level, and the Model CC, which allows for two breaks in the slope, in the place of Model A, which allows for a single break in the level, and Model C, which allows for a single break in the level and the slope, in the Zivot-Andrews' test (Arı and Özcan, 2015: 32-33). These models were formulated as follows:

Model AA: $$\Delta y_t = \mu + \beta t + \theta DU1_t + \omega DU2_t + \alpha y_{t-1} + \sum_{i=1}^{k} c_i \Delta y_{t-i} + \varepsilon_t \quad (1)$$

Model CC: $$\Delta y_t = \mu + \beta t + \theta DU1_t + \gamma DT1_t + \omega DU2_t + \psi DT2_t + \alpha y_{t-1} + \sum_{i=1}^{k} c_i y_{t-i} + \varepsilon_t \quad (2)$$

In these models, T_{B1} and T_{B2} refer to first and second break times, *DU* and *DT* refer to dummy variables that represent the break in the constant and the constant-trend, respectively. In Model AA, the dummy variable $DU1_t$ is expressed in a way to take the value one when $t > T_{B1}$ and zero in other cases; while the dummy variable $DU2_t$ is expressed in a way to take the value one when $t > T_{B2}$ and zero in other cases. In Model CC, the dummy variable $DT1_t$ is expressed in a way to take the value one when $t > T_{B1}$ and zero in other cases; while the dummy variable $DT2_t$ is expressed in a way to take the value $(T - TB2)$ when $t > T_{B2}$ and zero in other cases. The value that makes the t-statistics of α minimum is selected as the first and second break points (T_{B1}, T_{B2}). Optimal lag lengths (k) are calculated by the method proposed by Campbell and Perron (1991) and Ng and Perron (2001) (t-test) (Arı and Özcan, 2015: 33). In this test, which suggests that the series includes unit root without structural change under the null hypothesis (H_0), the alternative hypothesis (H_1) suggests that the series is stationary with two structural changes (Akbaş, Zeren and Özekicioğlu, 2013: 191-192).

4.2.2. Maki (2012) Cointegration Test

The equilibrium relationship between the series that are analysed with cointegration tests generally has structural breaks. Structural breaks result from policy changes, behaviors of economic units and certain shocks. Therefore, the structural breaks in the cointegration relationship affect the performance of cointegration test significantly and may cause erroneous results. For this reason, there is not sufficient cointegration relationship under structural breaks in traditional cointegration tests. For the solution of this problem, firstly Gregory and Hansen (1996) developed a cointegration test that allows for a one break and then Hatemi-J (2008) developed a cointegration test that allows for two structural breaks. Although these tests give better results than the standard cointegration tests, they assume one or two breaks only. Maki (2012) developed a new cointegration test for the cases with more than two breaks (Maki, 2012: 2011). Maki (2012) set up the following models to test the cointegration allowing for multiple breaks:

Model 0: $$y_t = \mu + \sum_{i=1}^{k} \mu_i D_{i,t} + \beta' x_t + \varepsilon_t \quad (3)$$

Model 1: $$y_t = \mu + \sum_{i=1}^{k} \mu_i D_{i,t} + \beta' x_t + \sum_{i=1}^{k} \beta_i' x_t D_{i,t} + \varepsilon_t \quad (4)$$

Model 2: $$y_t = \mu + \sum_{i=1}^{k} \mu_i D_{i,t} + \gamma t + \beta' x_t + \sum_{i=1}^{k} \beta_i' x_t D_{i,t} + \varepsilon_t \quad (5)$$

Model 3: $$y_t = \mu + \sum_{i=1}^{k} \mu_i D_{i,t} + \gamma t + \sum_{i=1}^{k} \gamma_i t D_{i,t} + \beta' x_t + \sum_{i=1}^{k} \beta_i' x_t D_{i,t} + \varepsilon_t \quad (6)$$

Here, Model 0 is the trendless model that allows for break in the constant term, Model 1 is the trendless model that allows for break in the constant term and the slope, Model 2 is the trend model that allows for break in the constant term and the slope, and Model 3 is the model that allows for break in the constant term, slope and trend. In the equations, the maximum number of breaks is shown with k (Karakurt, Şentürk and Şahingöz, 2018: 165). It should be kept in mind that if there is one break in the models, it will be compatible with the Gregory and Hansen's (1996) cointegration model, and if there are two breaks in the models, then it will be compatible with the Hatemi-J's (2008) model (Maki, 2012:2012). In these models where the null hypothesis (

H_0) suggests that no cointegration relationship exists between the series under the structural break in the equations, the alternative hypothesis (H_1) shows that there is a cointegration relationship between series under structural break.

4.3. Analysis and Findings

Results of the ADF and PP unit root test for the series are shown in Table 4, and results of the Lumsdaine and Papell (1997) (LP) unit root test for the series are shown in Table 5.

According to the results of the ADF and PP unit root tests in Table 4, it was found that the military expenditures, economic growth, and unemployment series are not stationary in their level values, but stationary at their initial difference values. Results of the LP unit root test obtained in the study are shown in Table 5.

Table 4. ADF and PP Unit Root Test Results

	ADF Test statistics		**PP Test statistics**	
Variables	**Constant Model**	**Constant and Trend Model**	**Constant Model**	**Constant and Trend Model**
LME	-1.096171 [0] (0.7046)	-1.592333 [0] (0.7729)	-1.409581 [4] (0.5648)	-2.121510 [4] (0.5143)
ΔLME	-4.164939 [0] (0.0029)*	-4.086086 [0] (0.0162)**	-4.226503 [4] (0.0025)*	-4.131607 [4] (0.0146)**
LEG	0.215073 [0] (0.9692)	-2.496323 [0] (0.3275)	0.562186 [5] (0.9862)	-2.531134 [1] (0.3121)
ΔLEG	-5.947032 [0] (0.0000)*	-5.840268 [0] (0.0002)*	-6.096513 [4] (0.0000)*	-6.285314 [5] (0.0001)*
LUNEMP	0.081486 [0] (0.9590)	-2.415565 [0] (0.3649)	1.092542 [10] (0.9965)	-2.109167 [5] (0.5208)
ΔLUNEMP	-4.846587 [0] (0.0005)*	-4.984656 [0] (0.0019)*	-4.804189 [10] (0.0006)*	-6.718861 [17] (0.0000)*

Note: * and ** show significance at the level of 1% and 5%, respectively. The values in parentheses show the probability values. In the ADF test, the values in square brackets show the appropriate lag lengths found according to the Schwarz information criterion (SIC). In the PP test, the values in square brackets show the bandwidth calculated according to the Newey-West method.

Table 5. LP Unit Root Test Results

	Model AA		**Model CC**	
Variables	**Test statistic**	**TB1** **TB2**	**Test statistic**	**TB1** **TB2**
LME	-4.7538 [0]	2002 2015	-4.2550 [0]	2000 2013
ΔLME	-7.0038* [0]	1999 2015	-7.3666* [0]	1995 2005
LEG	-4.4687 [0]	1993 1998	-5.4364 [0]	2000 2007
ΔLEG	-7.3377* [0]	2002 2010	-7.6576* [0]	2002 2010
LUNEMP	-4.3169	1994	-4.5505	2000

	[0]	2010	[0]	2010
ΔLUNEMP	-6.0053**	2003	-6.1576**	2003
	[0]	2009	[0]	2009

Note: In Model AA, the critical values at the significance level of 1%, 5% and 10% are -6.7400, -6.1600 and -5.8900, respectively. In Model CC, the critical values at the significance level of 1%, 5% and 10% are -7.1900, -6.7500 and -6.4800, respectively. Critical values were obtained from Ben-David et al. (2003). * and ** show significance at the level of 1% and 10%, respectively. The values in square brackets show the appropriate lag lengths that were calculated using the t-statistics from the general to the specific. TB1 and TB2 show the first and second break dates, respectively.

In the null hypothesis of LP test, it is assumed that there is unit root in the series without endogenous structural break. In the alternative hypothesis, the series are assumed to be trend stationary with two endogenous structural breaks. According to the findings obtained for Model AA and Model CC in the LP unit root test, it was found that military expenditures, economic growth and unemployment series have unit root without two structural breaks in level values, but are trend stationary with two endogenous breaks found in the initial difference values. As a result, the finding that series are not stationary in the level shows the presence of a possible cointegration relationship between the series (Göv, 2017). The Maki (2012) cointegration test, which allows for multiple structural breaks, was used in the study to test the existence of long-term relationships between *LEG-LME* and *LUNEMP-LME*. Results of the Maki (2012) cointegration test are shown in Table 6 and Table 7 below.

Table 6. Results of Maki Cointegration Test Between LEG-LME

Dependent Variable: LEG	Test Statistic	Break Dates	Critical Values		
			1%	5%	10%
Model 0	-7.4862533*	1995, 1997	−5.416	−4.893	−4.610
Model 1	-5.4658016**	1998, 2002, 2014	−5.833	−5.373	−5.106
Model 2	-7.5105427*	1997	−5.457	−4.895	−4.626
Model 3	-6.6531217**	1998, 2006, 2014	−7.082	−6.524	−6.267

Note: A model analysis with maximum 3 breaks was used. *, ** and *** show significance at the level of 1%, 5% and 10%, respectively. Critical values were obtained from Maki (2012).

Table 7. Results of Maki Cointegration Test Between LUNEMP-LME

Dependent Variable: LUNEMP	Test Statistic	Break Dates	Critical Values		
			1%	5%	10%
Model 0	-4.8653412***	1998, 2001	−5.416	−4.893	−4.610
Model 1	-6.0987356 *	1992, 1997, 2012	−5.833	−5.373	−5.106
Model 2	-5.9111955**	2000, 2005, 2016	−6.251	−5.703	−5.402
Model 3	-6.4955551*	2010	−6.048	−5.541	−5.281

Note: A model analysis with maximum 3 breaks was used. *, ** and *** show significance at the level of 1%, 5% and 10%, respectively. Critical values were obtained from Maki (2012).

Table 6 shows the results of Maki (2012) cointegration relationship between LEG and LME. According to these results, the hypothesis H_0, which assumes that no cointegration relationship exists under the structural break(s) found in all the models estimated, is rejected. Thus, it is accepted that there is a long-term relationship between the LEG and LME variables. Therefore, it was found that military expenditures and economic growth variables will act together in the long-term. Table 7 shows the results of Maki (2012) cointegration relationship between LUNEMP and LME. According to these results, the hypothesis H_0, which assumes that no

cointegration relationship exists under the structural break(s) found in all the models estimated, is rejected. Therefore, it was found that the LUNEMP and LME variables will act together in the long-term and thus it is accepted that there is a long-term relationship between the LUNEMP and LME variables.

When a cointegration relationship is found between the variables, long-term cointegration coefficients can be estimated for these variables. In the literature, Model 2 or Model 3 is preferred more than the estimation models given in Maki (2012). In the study, Model 3, which allows for break in the constant term, slope, and trend, was preferred for the estimation of long-term coefficients. The FMOLS estimator developed by Phillips and Hansen (1990) was used for long-term coefficient estimates. The models estimated are as follows:

$$LEG_t = \mu + \sum_{i=1}^{3} c_i D_{i,t} + \alpha LME_t + \varepsilon_t \tag{7}$$

$$LUNEMP_t = \mu + cD_{1,t} + \alpha LME_t + \varepsilon_t \tag{8}$$

While military expenditures were used as independent variables in both the models estimated above, economic growth in Equation 7 and unemployment in Equation 8 were used as dependent variables. The FMOLS long-term coefficient estimation results among the variables of the study are shown in Table 8 and Table 9.

Table 8. FMOLS Long-Term Coefficient Estimation Results Between LEG and LME

Dependent Variable: LEG				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Signif.**
Constant	9.053102	1.240368	7.29873	0.0000*
LME	0.422336	0.135881	3.10813	0.0019*
D1998	0.178813	0.059331	3.01379	0.0026*
D2006	0.213232	0.02517	8.47177	0.0000*
D2014	0.082771	0.023132	3.5782	0.0003*

Note: * shows significance at the level of 1%.

According to the FMOLS estimation results shown in Table 8, the coefficients of constant term, LME and dummy variables included in the model were found to be significant at a significance level of 1%. The structural break dates calculated in Model 3 (see Table 5) were used as dummy variable in Equation 7. According to the FMOLS long-term coefficient estimation results obtained for LME and LEG, it was found that military expenditures affect the economic growth positively. In other words, it was found that increasing military expenditures increased the economic growth. Our findings are parallel with the results of the studies conducted by Benoit (1978), Dunne et al. (2001), Destek and Okumuş (2016), Raju and Ahmed (2019), and Laniran and Ajala (2021) in the literature. Technological changes in defense sector increase the total factor productivity and thus contribute to the development of manufacturing industries. Human capital accumulation, public infrastructure investments and technological developments which increase in the industry as a result of military expenditures play a great role in the increase of economic growth.

Table 9. FMOLS Long-Term Coefficient Estimation Results Between LUNEMP and LME

Dependent Variable: LUNEMP				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Signif.**
Constant	3.129597	2.107098	1.48526	0.1375
LME	0.481558	0.227646	2.11538	0.0344**
D2010	0.349731	0.107734	3.24625	0.0012*

Note: * and ** show significance at the level of 1% and 5%, respectively.

According to the FMOLS estimation results shown in Table 9, the coefficients of LME and dummy variables included in the model were found to be significant at a significance level of 1%. The structural break date calculated in Model 3 (see Table 6) was used as dummy variable in Equation 8. According to the FMOLS long-term coefficient estimation results obtained for LME and LUNEMP, a positive relationship was found between military expenditures and unemployment. This can be interpreted in a way that increasing military expenditures has a negative effect on the employment volume and increases the unemployment. This finding is also supported by the results of the studies conducted by Barker et al. (1991), Dunne and Watson (2000), Yıldırım and Sezgin (2003), Qiong and Junhua (2015), and Erdugan and Özçelik (2020). It can be suggested that military expenditures increase the unemployment due to the fact that the increase in demand for and employment of skilled labor decreases the labor supply in defense industry.

When the results of the analysis are evaluated as a whole, it is observed that military expenditures in Turkey create a growth without employment, thus increasing both economic growth and unemployment. R&D investments and capital-intensive technologies are the main dynamics that lead to growth in defense industry. The productivity increase driven by technological innovations and technical knowledge creates an effect that decreases the labor supply and therefore the employment in defense sector.

5. Conclusion and Recommendations

Military expenditures have a significant share in total public expenditures and national incomes of both developed and developing countries. Governments can sometimes make plans with the intention of increasing military expenditures in order to boost the economy and provide the development. Economic growth and employment can be kept under control by adopting policies with a view to increase military expenditures during the recession periods and decrease them during the inflationary times. Military expenditure which is an important policy tool in stabilising the economies of developing countries is also an effective fiscal policy instrument in overcoming the cyclical unemployment problem seen in the contraction periods in developed countries (Bağcı, 2018: 349).

The fact that employment of high-capacity, high-skilled labor is preferred in defense industry causes the labor, which is unable to meet the needs of military industry in the market, to remain unemployed. Financing of military expenditures by taxes collected from workers and employers is another factor that decreases the labor demand and labor supply. Financing of military expenditures with taxes disorders the tax structure of the economy and decreases the investment and consumption expenditures, ultimately reducing the rates of output, growth, and employment. Moreover, the fact that the import of military weapons decreases the scarce foreign exchange reserves increasingly and makes a negative impact on the balance of payments affects the economic growth negatively, especially in developing countries.

In this study, the impact of military expenditures on economic growth and unemployment in Turkey was researched on the basis of the period of 1988-2019. The relationship between the series was tested by means of ADF and PP unit root tests, Lumsdaine-Papell (LP) unit root test which allows for two structural breaks, and Maki (2012) cointegration test which allows for up to five structural breaks. As a result of the unit root tests performed in the study, it was found that LME, LEG and LUNEMP variables have unit root in their level values, but these variables are stationary in the first order. Thus, a cointegration analysis was made between the related series. According to the results of the Maki (2012) cointegration test, it was found that a cointegration relationship exists between LME and LEG, and LME and LUNEMP under the structural breaks. So, these variable pairs act together in the long-term with the identified structural breaks. After the presence of a cointegration relationship between the above-mentioned variable pairs was found, the FMOLS estimator was used to estimate the long-term coefficients. According to these results, it was found that the LME variable affected both LEG and LUNEMP positively in the long-term. In other words, this result showed that increasing military expenditures have affected the economic growth positively and increased the unemployment, decreased the employment.

When government increases military expenditures, this creates an increase in aggregate demand with the multiplier effect. Increasing demand enhances capacity utilization, output level and ultimately economic growth. Positive externalities that the innovative developments in weapon technologies reflect on the public and private sectors together with the investments in R&D in defense industry can increase the level of output and national income. Considering the positive impact of technology and economic efficiency on growth, it can

be suggested that the share allocated to the military expenditures in Turkey should be increased continuously. Ongoing R&D investments should continue and thus a contribution should be made to the economic growth in line with the developing technologies.

Invention of high technology goods in defense industry and the use of capital-intensive military equipment in production will decrease the earnings from employment of labor. The advanced technologies used require the production operations in the sector to be performed through intensive capital and skilled labor. Technological developments leave unskilled workers out of the labor market and thus reduce the employment in defense industry. In Turkey, the development of innovative and new employment capacities in the market in line with the needs of defense industry will contribute to the employment of idle labor in this industry. In order to achieve economic development and increase of social welfare in the country, it is important that the growth is sustainable, employment-oriented growth policies are implemented and military expenditures are planned accordingly.

Determining the optimum level of military expenditures and allocation of resources for such expenditures at a reasonable rate are important for economic development and sustainable growth in Turkey. Domestic investments should be increased by way of such expenditures without wasting the military expenditures. Economising on the budget by avoiding unnecessary expenditures in defense, utilising such savings for public services and investments, and reducing the tax burdens on citizens for their financing is an effective solution to achieve and maintain economic growth and employment in Turkey.

References

Akbaş, Y.E., Zeren, F. and Özekicioğlu, H. (2013). Türkiye'de parasal aktarım mekanizması: Yapısal VAR analizi. *C.Ü. İktisadi ve İdari Bilimler Dergisi, 14*(2), 187-198.

Arı, A. and Özcan, B. (2015). Tüketim-gelir oranının durağanlığı: Türkiye örneği. *Hacettepe Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi, 33*(3), 23-46.

Aydemir, A.F., Özdemir, D., Kabadayı, B. and Emsen, Ö.S. (2016). G-20 ülkelerinde işsizlik ve askeri harcamalar arasındaki ilişkiler. S. Sarı, A.H. Gencer and İ. Sözen (Ed.), in *7th International Conference on Eurasian Economies* (437-444. pp.), Kaposvár, Hungary, 29-31 August 2016.

Bağcı, E. (2018). Eğitim düzeyinin işsizlik üzerindeki etkisi: Gelişmiş ve gelişmekte olan ülkelerin karşılaştırılması. *Finans, Ekonomi ve Sosyal Araştırmalar Dergisi, 3*(1), 348-358.

Bağcı, E. and Börü, M.K. (2018). Ekonomik büyüme ve işsizlik arasındaki ilişki: Türkiye'de ekonometrik bir analiz. *International Journal of Academic Value Studies, 4*(22), 890-897.

Barker, T., Dunne, P. and Smith, R. (1991). Measuring the peace dividend in the United Kingdom. *Journal of Peace Research, 28*(4), 345-358.

Becker, J. (2021). Rusty guns and buttery soldiers: Unemployment and the domestic origins of defense spending. *European Political Science Review,* 1-24. https://dx.doi.org/10.1017/S1755773921000102

Benoit, E. (1973). *Defense and economic growth in developing countries*. Lexington: Lexington Books.

Benoit, E. (1978). Growth and defense in developing countries. *Economic Development and Cultural Change, 26*(2), 271-280.

Campbell, J.Y. and Perron, P. (1991). Pitfalls and opportunities: What macroeconomists should know about unit roots. *NBER Macroeconomics Annual, 6*, 141-201.

Canbay, Ş. and Mercan, D. (2020). Unemployment effects of military spending in Turkey. *Journal of Yasar University, 15*(60), 941-952.

Cappelen, A., Gleditsch, N.P. and Bjerkholt, O. (1984). Military spending and economic growth in the OECD countries. *Journal of Peace Research, 21*(4), 361-373.

Chester, E. (1978). Military spending and capitalist stability. *Cambridge Journal of Economics, 2*(3), 293-298.

Değer, S. (1986). Economic development and defense expenditure. *Economic Development and Cultural Change, 35*(1), 179-196.

Değer, S. and Sen, S. (1995). Military expenditure and developing countries. K. Hartley, T. Sandler (Ed.), in *Handbook of Defense Economics* (275-307. pp), Amsterdam: Elsevier Science.

Değer, S. and Smith, R. (1983). Military expenditure and growth in less developed countries. *The Journal of Conflict Resolution, 27*(2), 335-353.

Demir, M. and Geyik, O. (2019). Evaluation of the impact of globalization on health expenditures in terms of public finance. D.D.Çevik, O. Geyik (Ed.), in *Contemporary Issues in Labor, Public Finance & Administration* (59-70. pp), IJOPEC Publication, London.

Destek, M.A. and Okumuş, I. (2016). Military expenditure and economic growth in BRICS and MIST countries: Evidence from Bootstrap panel Granger causality analysis. *South-Eastern Europe Journal of Economics, 14*(2), 175-186.

Dickey, D.A. and Fuller, W.A. (1979). Distribution of the estimators for autoregressive time series with a unit root. *Journal of the American Statistical Association, 74*(366), 427-431.

Dunne, P. (1996). Economic effects of military expenditure in developing countries: A survey. N. Gleditsch, O. Bjerkholt, A. Cappelen, R. Smith, P. Dunne (Ed.), in *The Peace Dividend Contributions to Economic Analysis* (439-464. pp), 235, Emerald Group Publishing Limited.

Dunne, P., Nikolaidou, E. and Vougas, D. (2001). Defence spending and economic growth: A causal analysis for Greece and Turkey. *Defence and Peace Economics, 1*2(1), 5-26.

Dunne, P. and Watson, D. (2000). Military expenditure and employment in South Africa. *Defence and Peace Economics, 11*(4), 587-596.

Durgun, Ö. and Timur, M.C. (2017). Savunma harcamaları ve ekonomik büyüme ilişkisi: Türkiye analizi. *Dumlupınar Üniversitesi Sosyal Bilimler Dergisi, 54,* 126-137.

Erdugan, F. and Özçelik, Ö. (2020). Savunma harcamaları ve istihdam ilişkisi: Panel veri analizi. *Siyaset, Ekonomi ve Yönetim Araştırmaları Dergisi, 8*(2), 152-168.

Eshag, É. (1983). *Fiscal and monetary policies and problems in developing countries*. Cambridge: Cambridge University Press.

Fontanel, J. (1995). The economics of disarmament. K. Hartley, T. Sandler (Ed.), in *Handbook of Defense Economics* (563-590. pp), Amsterdam: Elsevier Science.

Giray, F. (2004). Savunma harcamaları ve ekonomik büyüme. *Cumhuriyet Üniversitesi İktisadi ve İdari Bilimler Dergisi, 5*(1), 181-199.

Göv, A. (2017). Relationship between energy consumption and economic growth: Structural breaks cointegration analysis in the case of Turkey. *Journal of Applied Research in Finance and Economics, 3*(1), 10-18.

Gregory, A.W. and Hansen, B.E. (1996). Residual-based tests for cointegration in models with regime shifts. *Journal of Econometrics, 70*(1), 99-126.

Gürsoy, S. and Kartal, K. (2020). Takas ekonomisinden altın paraya, kâğıt paradan dijital (sanal) paraya dönüşüm: Kripto paralar; bitcoin ve blockchain sistemlerinin araştırılması. S. Gürsoy, D. Agcadag (Ed.), in *İktisat ve İşletme Alanında Değişen Yaklaşımlar* (79-106. pp), İksad Yayınevi.

Hatemi-J,A. (2008). Tests for cointegration with two unknown regime shifts with an application to financial market integration. *Empirical Economics, 35*(3), 497-505.

Hou, N. and Chen, A.B. (2013). Military expenditure and economic growth in developing countries: Evidence from system GMM estimates. *Defence and Peace Economics, 24*(3), 183-193.

Huang, J.T. and Kao, A.P. (2005). Does defence spending matter to employment in Taiwan?. *Defence and Peace Economics, 16*(2), 101-115.

Islam, M.O. (2015). The relation between military expenditure & economic growth in developing countries: Evidence from a panel of 41 developing countries*. IOSR Journal of Economics and Finance, 6*(4), 57-65.

Karakurt, B. Şentürk, S.H. and Şahingöz, B. (2018). Türkiye'de savunma harcamalarının enflasyon üzerindeki etkisi: Yapısal kırılmalı eşbütünleşme analizi. *Maliye Dergisi, 175*(Temmuz-Aralık), 154-170.

Korkmaz, Ö. and Bilgin, T. (2017). Askeri harcamalar ile ekonomik büyüme arasındaki ilişki: Türkiye ve Amerika Birleşik Devletleri'nin karşılaştırmalı analizi. *Uluslararası İktisadi ve İdari İncelemeler Dergisi*, *2017*(18), 289-316.

Künü, S. (2013). *Kamu harcamalarının ekonomik büyüme üzerine Etkileri: Türkiye üzerine bir uygulama*. (Yayımlanmamış doktora tezi). Atatürk Üniversitesi Sosyal Bilimler Enstitüsü, Erzurum.

Laniran, T.J. and Ajala, O. (2021). Military expenditure and economic growth: Evidence from Nigeria. *American Journal of Economics, 11*(1), 10-18.

Lim, D. (1983). Another look at growth and defense in less developed countries. *Economic Development and Cultural Change, 31*(2), 377-384.

Lobont, O.R., Glont, O.R., Badea, L. and Vatavu, S. (2019). Correlation of military expenditures and economic growth: Lessons for Romania*. Quality & Quantity, 53*, 2957-2968.

Looney, R.E. (1994). *The economics of third world defense expenditures.* London: Jaı Press, Inc.

Looney, R.E. (1997). Excessive defense expenditures and economic stabilization: The case of Pakistan. *Journal of Policy Modeling, 19*(4), 381-406.

Lumsdaine, R.L. and Papel, D.H. (1997). Multiple trend breaks and the unit-root hypothesis. *Review of Economics and Statistics, 79*(2), 212-218.

Maki, D. (2012). Tests for cointegration allowing for an unknown number of breaks. *Economic Modelling, 29*(5), 2011-2015.

Ng, S. and Perron, P. (2001). Lag length selection and the construction of unit root tests with good size and power. *Econometrica, 69*(6), 1519–1554.

Nugroho, D.A. and Purwanti, E.Y. (2021). Impact of military expenditure on economic growth: Encouraging or constraining? *Journal of Economics and Policy, 14*(1), 9-20.

Ologbenla, P. (2020). Military expenditure and macroeconomic performance-the case of an emerging country. *Sciendo, 65*(1), 67-83.

Onuoha, F.C. and Agbede, M.O. (2019). Impact of disaggregated public expenditure on unemployment rate of selected African countries: A panel dynamic analysis. *Journal of Economics, Management and Trade, 24*(5), 1-14.

Payne, J.E. and Ross, K.L. (1992). Defense spending and the macroeconomy. *Defence Economics, 3*(2), 161-168.

Phillips, P.C. and Hansen, B.E. (1990). Statistical inference in instrumental variables regression with I (1) Processes. *The Review of Economic Studies, 57*(1), 99-125.

Phillips, P.C. and Perron, P. (1988). Testing for a unit root in time series regression. *Biometrika, 75*(2), 335-346.

Qiong, L. and Junhua, H. (2015). Military expenditure and unemployment in China. *Procedia Economics and Finance, 30*, 498-504.

Raju, M.H. and Ahmed, Z. (2019). Effect of military expenditure on economic growth: Evidences from India, Pakistan and China using cointegration and causality analysis. *Asian Journal of German and European Studies, 4*(3), 1-8.

Ram, R. (1995). Defense expenditures and economics growth. K. Hartley, T. Sandler (Ed.), in *Handbook of Defense Economics* (251-273. pp), Amsterdam: Elsevier Science.

Rehman, S.F. (2020). Exploring the long run effects and relationship of military expenditures and economic growth in the scenario of Pakistan. *Bulletin of Business and Economics, 9*(3), 106-112.

Stockholm International Peace Research Institute (2020), Military expenditure database. Access address https://www.sipri.org/databases/milex.

The World Bank (2020), Military expenditure (US$). Access address https://databank.worldbank.org/source/world-development-indicators.

Topal, M.H. (2018a). Türkiye'de askeri harcama ve işsizlik ilişkisi: Çoklu yapısal kırılmalar altında eşbütünleşme analizi ve zamanla değişen nedensellik. F. Yardımcıoğlu, F. Beşel, H. Bağcı and F. Pekşen (Ed.), in *4. International Congress on Political, Economic and Social Studies* (139-158. pp.), 2(4), Venice, Italy, 28-30 June 2018.

Topal, M.H. (2018b). Türkiye'de askeri harcamalar ile ekonomik büyüme arasındaki ilişkinin bir analizi (1960-2016). *Maliye Dergisi, 174,* 175-202.

Topal, M.H., Unver, M. and Türedi, S. (2021). The military expenditures and economic growth nexus: Panel Bootstrap Granger causality evidence from NATO countries. Panoeconomicus, Advance Online Publication, 1-16. https://dx.doi.org/10.2298/PAN170914002T.

Turkish Statistical Institute (2020). Access address https://www.tuik.gov.tr/.

Uçan, O., Öztürk, M.B. and Akyıldız, A. (2016). The defence spending-growth nexus in Turkey. *European Scientific Journal, June 2016* (Special Edition), 53-60.

Üçler, G. (2017). Türkiye'de savunma harcamalarının işsizlik üzerine etkisi: 1980-2014 dönemi için ekonometrik bir analiz. *Journal of Yasar University, 12*(46), 161-170.

Waheed, M., Alam, T. and Ghauri, S.P. (2006). Structural breaks and unit root: Evidence from Pakistani macroeconomic time series. *MPRA Paper,* No: 1797.

Yıldırım, J. and Sezgin, S. (2003). Military expenditure and employment in Turkey. *Defence and Peace Economics, 14*(2), 129-139.

Zhong, M., Chang, T., Tang, D.P., and Wolde-Rufael, Y. (2015). The causal nexus between military spending and unemployment in the G7: A Bootstrap panel causality test. *Defence and Peace Economics, 26*(6), 609-622.

Zivot, E. and Andrews, D.W.K. (1992). Further evidence on the great crash, the oil-price shock, and the unit-root hypothesis. *Journal of Business & Economic Statistics, 10*(3), 251-270.