

## MILITARY EXPENDITURES AND ECONOMIC GROWTH IN MIDDLE EAST AND NORTH AFRICAN COUNTRIES<sup>1</sup>

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### Abstract

The Middle East and North Africa (MENA), an economically diverse region, is characterized by countries with a common heritage, which are at various stages of economic development, and home to extremely different natural resources. Majority of the countries in the region have experienced military or civil conflicts. These were conflicts that resulted in extreme human suffering, economic displacement, and the nations of the region had wasted several opportunities of development. Thus, a significant share of national budgets are utilized for military spending. Military expenditures create both costs and benefits for the economy.

In this study, the relationship between military expenditures and economic growth in MENA Countries using panel econometric models for 1990-2017 period. In this study a negative and highly significant effect of infrastructure on economic growth is exist. The coefficient is -0.068 which means a one point increase military expenditure leads to approximately 0.06 point decrease in economic growth.

**Keywords:** Military expenditures, MENA, Economic growth, Panel data analysis, Dynamic panel data

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## **Orta Doğu ve Kuzey Afrika Ülkelerinde Savunma Harcamaları ve Ekonomik Büyüme**

### **Öz**

Ekonomik olarak çeşitli bir bölge olan Orta Doğu ve Kuzey Afrika (MENA), ekonomik gelişmenin çeşitli aşamalarında olan ve son derece farklı doğal kaynaklara ev sahipliği yapan, ortak bir mirasa sahip ülkeler ile nitelenir. Bölgedeki ülkelerin büyük çoğunluğu askeri veya sivil çatışmalar yaşamıştır. Bunlar olağanüstü sayıda insanın acı çektiği ve ekonomik kayıplar ile sonuçlanan çatışmalardı ve bölge ulusları birçok gelişme fırsatını heba etti. Bunlar olağanüstü sayıda insanın acı çektiği ve ekonomik kayıplar ile sonuçlanan çatışmalardı ve bölge ulusları birçok gelişme fırsatını heba etmiştir. Nitekim ulusal bütçelerin önemli bir kısmı, askeri harcamalar için kullanılmaktadır. Askeri harcamalar ekonomi için hem fayda hem de maliyet oluşturur.

Bu çalışmada Orta Doğu ve Kuzey Afrika ülkelerindeki askeri harcamalar ile ekonomik büyüme arasındaki ilişki 1990-2017 dönemi için panel ekonometrik modeller kullanılarak yapılmıştır. Bu çalışmada, altyapının ekonomik büyüme üzerinde olumsuz ve oldukça önemli bir etkiye sahip olduğu bulunmaktadır. Katsayı -0.068'dir, bu da askeri harcamanın bir puanlık artmasının, ekonomik büyümede yaklaşık 0.06 puanlık bir azalmaya yol açtığı anlamına gelir.

**Anahtar Kelimeler:** Askeri harcamalar, MENA, Ekonomik büyüme, Panel veri analizi, Dinamik panel veri

## **Introduction**

The impact of defense expenditures on economic growth has been the focus of economic research for an extended period of time. Increased military spending as a share of national budget and related interests of arms industry renewed the debate on the impact of increases in military spending on economic growth and welfare. Several studies scrutinized the long and short term impacts of military expenses on the economy.

Government military spending has an impact beyond the resources it consumes, particularly when these expenditures result in or facilitate conflicts. Thus, it might have significant economic consequences. Military spending could have both positive and negative impact on the economy.

Military government spending was a global problem at the end of the Second World War when several developed and developing countries had a chance to decrease their military expenditures. An increase in defense expenditures are usually a political response to national insecurity and could be an output of international arms race. Furthermore, developed countries could have a concern about the adverse effects of unrestrained military spending in developing countries. It has been claimed that military spending could lead to a balance of payments deficit, slow down the economic growth, and thus, result in significant social and economic expenses (Haseeb, 2014, p. 1).

Majority of the least developed (LDCs) and developing countries (DCs) experienced military or civil conflicts since the 1990's. Some of these conflicts were national, while others were international conflicts, however they both caused equal and extensive human suffering, economic problems and wasted development opportunities.

Economically, MENA is a diverse region which includes countries that share a common heritage, are in different stages of economic development and benefit from diverse natural resources. On the other hand, most have experienced one level or another of military or civil conflicts. These conflicts caused equal and extensive human suffering, economic problems and wasted development opportunities. Consequently, a significant share of the budgets of these nations are reserved for military expenditures. In MENA countries, armed forces play the significant role of preserving the political regime. Thus, military receive a giant's share in national budgets mostly based on their perception as the masters of politics in these nations (Shahid & Saba, 2015, p. 48). Security problems that are

among the most distinctive problems in MENA countries have resulted in increasing defense spending.

Continuous increases in the share of military spending in national budgets and the priorities invested in the arms industry renewed the discussions on the impact of the growth in military spending on the growth and welfare. Several scholars took part in this debate and investigated the short and long term effects of military spending on the economy.

According to the Keynesian approach, military spending increases the aggregate demand and contributes to economic growth through construction of infrastructure such as roads, buildings, bridges, etc. and results in developments in technology that could be utilized by private industries as well. On the other hand, neoclassical approach claims that defense expenditures have a negative impact on economic growth by transferring resources otherwise available to the private sector to defense and related industries. Furthermore, when a country does not have a solid defense budget, it needs to import defense products, which would result in an increase in foreign debt transfer of national resources (Künü et.al., 2016, p. 80).

The purpose of the present paper is to determine empirically whether military spending is related to economic growth in MENA countries.

In this study, military expenditures and economic growth in MENA countries were discussed, and the related literature was reviewed, and then aim, data and methodology was addressed and the results discussed and finally the findings of the study were presented.

### **Military Expenditures and Economic Growth in MENA Countries**

Military spending is a significant part of the national budget of every nation. Military expenditures are defined as the government spending on national defense based on national fiscal policies in economics (Islam, 2015, p. 57).

Political conflicts in different forms have been observed in Middle East and North Africa (MENA) countries since 2011. The main reason for these conflicts were the under-developed nature of these countries and poverty. In MENA region, there is an ongoing civil war in Syria, Iraq, Libya and Yemen, causing extreme human loss and the destruction of physical infrastructure. Fifteen million individuals are displaced, most to countries with political and / or economic instability such as Jordan, Lebanon,

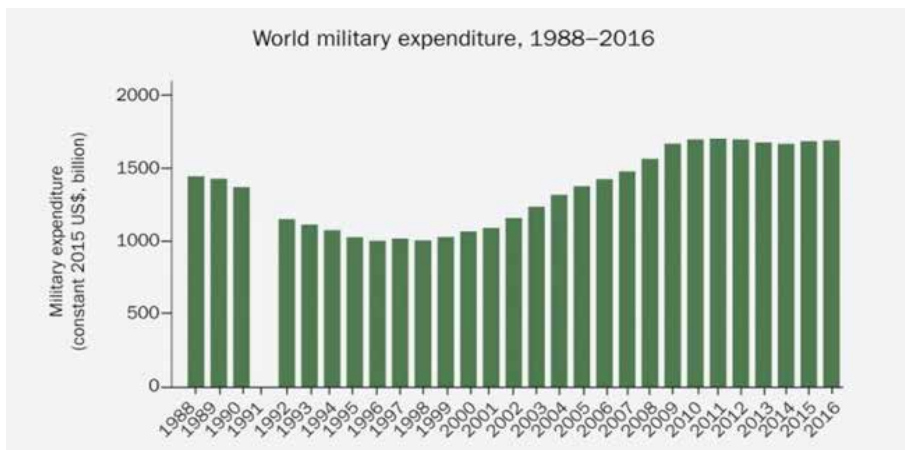
Djibouti and Tunisia, resulting in the largest refugee crisis since the World War II. The current chaos in Yemen is expected to result in the loss of years of development. Gaza under blockade and the threat of violence has one of the highest unemployment rates worldwide and the GDP is at 40% of its potential. Countries such as Algeria, Iran and the GCC (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, United Arab Emirates), which are oil exporters and experience a relative stability, now face problems such as low oil prices and a chronic youth unemployment and undiversified economy (World Bank ).

Although there was a global decline in military spending after the cold war, the Middle East was an exception to this rule, where military expenditures were on the rise. Both the economics and demographics, as well as security considerations were significant for the stability in the region (Yıldırım et al., 2005, p. 285).

As of 2016, global military spending increased for the second successive year to USD 1,616 billions, the first successive annual rise since 2011, the year when military expenditures were at an all-time high of USD 1,699 billions. Military spending trends and patterns differ among regions significantly. For instance, military spending in Asia, Oceania, Central and Eastern Europe and North Africa continues to increase, while it decreased in Central and South American, Caribbean, Middle Eastern and Sub-Saharan Africa countries (SIPRI).

### **Graph 1.**

*Global Military Expenditure 1988-2016*



Source: SIPRI

Global defense expenditures accounted for 2.2% of global GDP in 2016. This rate was highest in the Middle East (in countries where data was available) with an average rate of 6.0% in 2016.

Especially in the Middle East, military has been considered as a reliable tool to sustain the political regimes. Scarce resources have been allocated to defense spending, justified by political instability, radical Islamist fundamentalism and external threats, and as a result, investments in economic and social development were adversely affected in these nations. Thus, it is important to determine the effects of military expenditures on growth (Yıldırım et al., 2005, p. 285).

According to Keynesian approach, military spending promotes aggregate demand and increases in utilization of capital, employment, profits and thus, creating an increase in investments and therefore affecting the economic growth positively. It also might promote growth through investments in infrastructure such as construction of roads, buildings, bridges, etc. and promoting technological advances that could also be used by the private industries. Neoclassical approach, on the other hand, claims that defense expenditures discriminate against private sector by channeling investments that would be more productive in private hands to defense contractors and related businesses, hence has a negative impact on economic growth. In countries without an advanced military industry, national defense is highly dependent on imports. This might affect economic growth adversely by increasing foreign debt and transfer of resources to foreign countries (Künü et. al., 2016, p. 80). It could also have adverse effects when the defense expenditures are financed with increased money supply, or domestic and international borrowing or depleting foreign currency stocks. Furthermore, military spending could also have adverse impact on foreign debt due to the import of advanced technologies or intermediate goods required by the defense industry (Günlük Şenesen, 2004, p. 147).

Military spending is a component of fiscal policy and has numerous potential theoretical effects on the economy. These effects could be considered as positive or negative based on the specific perspective. Increase in defense expenditures could reduce unemployment induced by low consumption or underinvestment. Defense industry research and development (R&D) could have a positive impact on private investments via spin-offs and transfers of technology. Certain approaches are related to the least developed countries (LDCs). As such, it could be argued that military spending could help improve social infrastructure and other

public-domain goods and services. Military expenditures might also improve the social skill set via the training of military personnel. Military spending promotes a stable business environment that facilitates foreign investments via providing security. However, defense expenditures might divert the investments from the private sector where they could be utilized more efficiently. Arms imports could affect the balance of payments adversely. Increased orientation to military R&D could divert the much-needed R&D investments from private sector where the output could be utilized for more practical goals. Governments might raise taxes to finance military spending that could limit economic growth. It could also utilize resources and technology that would otherwise be used by exports industries, producing higher economic growth (Islam, 2015, p. 58).

### **Literature Review**

There are several studies in the literature on the impact of military spending on economic growth. Several studies reported that military expenditures could have both negative and positive effects on the economy, while certain studies argued that it had no impact on economic growth.

Studies in the literature of economics of defense frequently investigated the correlation between defense expenditures and economic growth empirically since the significant study by Benoit. Benoit (1973) reported that military spending has a positive external effect that is absorbed by the economy. He evidenced that military spending is positively related to economic growth in LDCs. He based the claim on the conceptual framework that in LDCs, military institutions are more efficient than their bureaucratic counterparts in providing non-military welfare services for poor people. Furthermore, deployment of armed forces to conflict zones provide a secure environment where agricultural and non-agricultural production could benefit in LDCs.

Hassan et al. (2003) scrutinized the empirical growth in five out of seven South Asian Regional Cooperation Council (SAARC) nations and focused on the impact of military spending on economic growth using 1980-1999 panel data. Their findings demonstrated that there was a positive correlation between military spending and economic growth, showing that military spending could have a positive effect on growth.

Anwar et al. (2012) investigated military expenditures with respect to

perceived and real security threats in Pakistan and correlation between military spending and economic growth in an empirical study using 1980-2010 time series. Study findings demonstrated that there was a long-term correlation between military spending and economic growth, while economic growth granger causes defense spending.

In a study by Sezgin (2000), the correlation between defense expenditures and economic growth in Turkey and Greece was analyzed. Study findings demonstrated that defense spending positively affected economic growth in these two nations.

Yıldırım et al. (2005) investigated the impact of military spending on economic growth in Middle Eastern countries and Turkey for 1989-1999. The correlation between military spending and economic growth was analyzed with cross-section and dynamic panel estimation methods. Conducted empirical analysis identified that military spending increased economic growth in the Middle Eastern countries and Turkey.

Farzanegan (2012) scrutinized the dynamics between the economic growth and defense expenditures in Iran. The study investigated whether the shocks on Iranian military budget had an impact on the economic growth. The findings showed that growth in defense expenditures (its share in total expenditures, GDP or per capita) explained future economic growth in Iran.

Halıcıoğlu (2004) reported new empirical evidence about the correlation between the economic growth and defense expenditures in Turkey between 1950 and 2002. The study utilized the new macroeconomic theory and multivariate co-integration method and empirically demonstrated a positive and long-term correlation between aggregate military spending and aggregate output in Turkey.

DeRouen (2000) demonstrated that short-term increases in military spending contracted the economic growth in Israel when technological growth was employed as control. The same study determined that non-defense spending promoted growth.

In a study by Hirnissa et al. (2016) that investigated the causality between defense expenditures and economic growth in twenty developing countries, it was found that on average, there was a co-integration between defense expenditures and economic growth in all selected developing countries. The panel error-correction model utilized in the study strongly indicated that there was a long-term correlation between defense



expenditures and economic growth in these developing nations during the study period. However, it was found that the long-term effect was unidirectional and only economic growth affected defense expenditures. Thus, it could be argued that economic growth has a positive effect on the growth of defense industry on average in the twenty developing nations scrutinized in the study, but the vice-versa was not true.

Some studies indicated that there was a negative correlation between military expenditures and economic growth.

Stroup & Heckelman (2001) predicted the impact of military spending on growth in African and Latin American nations. 1975-1989 panel data for 44 African and Latin American countries were used in the study. The findings demonstrated that low levels of military spending improved economic growth, however higher levels of military spending has a negative impact on growth.

In a study by Pan et al. (2014), panel causality analysis was utilized to determine the correlation between defense spending and economic growth in 10 Middle Eastern nations based on cross-sectional dependence and heterogeneity across countries. The findings showed that there was a unidirectional causality from military spending to growth in Turkey, a unidirectional causality from economic growth to military spending in Egypt, Kuwait, Lebanon, and Syria, and a bidirectional causality in Israel, and it was found that there was no correlation between defense spending and economic growth in Jordan, Oman, and Saudi Arabia. Empirical findings did not provide consistent data on the correlation between defense spending and economic growth in the abovementioned countries.

In a study, Smith (1980) utilized 1954-1973 data for 14 large OECD countries and tested the hypothesis that reduced investments were a major opportunity cost for military expenditures in the postwar period. Findings demonstrated that military spending had a clear negative impact on investments. Lebovic & Ishaq (1987) determined that higher military spending inhibited economic growth in the Middle East.

Khalid et al. (2015) aimed to examine the correlation between military expenditures and economic growth in United States of America (USA) with Autoregressive Distributed Lag (ARDL) bounds testing approach to co-integration between 1970 and 2011. The findings showed that there was a negative correlation between military expenditures and economic growth.

Agostino et al. (2013) investigated the possible significance of endogeneity and utilized the conflict onset as an instrument for military expenditures with an endogenous growth model in predetermined African nations using 1989-2010 panel data. It was found that military expenditures had a negative impact on economic growth.

Dunne & Nikolaidou (2011) utilized Solow-Swan model using both panel and time series data to find empirical evidence about the economic impacts of military spending in EU15 countries between 1961 and 2007. Both panel and time series methods provided consistent evidence that demonstrated military spending did not foster economic growth in these countries.

Al-Jarrah (2005) analyzed the causal relationship using two models: the correlations between military spending and total real economic growth, and military spending and non-oil real growth in Saudi Arabia between 1970 and 2003. Findings demonstrated that there was a bidirectional causal relationship between military spending and economic growth and an unidirectional causal relationship from non-oil economic growth to military spending, where the impact of military spending was negative and strong in short-term.

Apanisile & Okunlola (2014) investigated the short-term and long-term effects of military spending on economic output in Nigeria. Study findings indicated that military spending had a negative and significant effect on economic output in the short-term but the same effect was positive and significant in the long-run, while labor and capital had positive significant effects both in short and long term. Furthermore, labor had the highest coefficient (3.0709) in the long-term.

Dunne (2012) utilized 1988-2006 cross-country panel data to elaborate on the economic impact of defense expenditures in a study. The analysis focused on nations located in a region that experienced extensive conflicts in that period, namely Sub Saharan Africa (SSA), with different income levels and categorized into subgroups to provide a relatively current analysis. The findings demonstrated that military spending had a significant negative short-term impact and an insignificant long-term impact on per capita GDP growth and the impact was not consistent across different income groups.

Aizenman & Glick (2006) investigated the long-term effects of defense spending on economic growth. They reported that defense spending due

to external threats would promote growth, however defense spending to gain personal interest and due to corruption would reduce growth.

Dunne & Tian (2013) examined the effect of military spending on growth using a large and balanced panel data and exogenous growth and dynamic panel data methods with 1988-2010 data for 104 countries. It was reported that there was a significant negative impact of military expenditures on growth for the whole sample, and the effect was stronger in African countries. The findings reflected a certain level of heterogeneity, however also reflected that the impact of military expenditures on growth was insignificant for middle-income African countries, African countries that never experienced conflict, non-African countries with abundant natural resources, and non-African countries with a relatively close economy. It was an interesting finding that in all scrutinized groups, no evidence of significant positive impact of military spending on economic growth was found.

Korkmaz (2015) investigated the effects of military expenditures on economic growth and variables of unemployment (macroeconomic variables) in 10 Mediterranean countries that were considered to be significant in the region. The study was conducted with panel data analysis using 2005-2012 data. Results of the analysis showed that although military expenditures affected the economic growth in these countries negatively, it increased unemployment.

In a study conducted by Künü et al. (2016), the impact of military spending on economic growth was investigated in 12 Middle Eastern nations using 1998-2012 data. The empirical study demonstrated that military spending had a negative impact on economic growth that increased during times of internal and external conflict.

Yang et al. (2011) determined that there was a significant negative correlation between military spending and economic growth in 23 countries with an initial income (threshold variable) of USD 475.93 or less, when the level of threat is aggravated, it was found that economic growth in these 23 countries would decrease. However, in cases where a significant threat is present, military spending promotes growth. For the remaining 69 nations with an initial income (real GDP per capita in 1992 prices) of more than USD 475.93, there was no significant correlation between military spending and economic growth regardless of the threat variable.

Wijeweera & Webb (2011) studied the correlation between finance expenditures and economic growth using panel co-integration method with 1988-2007 data for five South Asian countries (India, Pakistan, Nepal, Sri Lanka and Bangladesh). Study findings demonstrated that a 1% increase in finance spending increased the real GDP only by 0.04%, thus it could be argued that the substantial public spending in military industry in these countries had an insignificant impact on economic growth.

Islam (2015) conducted a study to investigate the correlation between military spending and GDP in 41 developing countries between 2001 and 2010. It was found that the impact of military spending on GDP growth was either positive or negative in different nations. Thus, the study concluded that country-specific factors were significant in determining the correlation between military spending and GDP growth. Shahid and Saba (2015) reported that inducing economic growth with high military spending was neither effective nor efficient in achieving higher economic growth.

### **Aim, Data and Methodology**

The empirical purpose of this study is to measure the effect of infrastructure on growth. With this purpose; a model consisting of synthetic infrastructure index and the set of instrumental variables employed. In this setting; the model that will be estimated is;

$$y_{i,t} - y_{i,t-1} = \rho y_{i,t-1} + \beta MEXP_{i,t} + \gamma X_{i,t} + \mu_t + \eta_i + \varepsilon_{it}$$

where  $i$  and  $t$  represent country and time dimensions of the model. As the model includes the lagged level of Economic Growth in the set of explanatory variables, it is dynamic.  $y_{i,t}$  represents economic growth, thus our dependent variable is Economic Growth. In the explanatory variables  $y_{i,t-1}$  also could be used to detect the convergence hypothesis. Thus, we detect the transitional convergence. Our core explanatory variable is,  $MEXP_{i,t}$  which is a infrastructure index composed of military expenditures indicators.

$X_{i,t}$  is a set of control variables that are mostly cited ones used in the literature. The first one of these variables is terrorism index, the second variable is total government expenditure, the third variable is financial development level of countries and the fourth one is inflation rate.

In order to estimate the model specified in the previous section, this study construct a panel data set between 1990 and 2017 comprising MENA countries. We consider a dynamic panel data model of the form

$$y_{it} - y_{i,t-1} = \rho y_{i,t-1} + \beta' X_{it} + \eta_i + \varepsilon_{it}$$

$$i \in (1, \dots, N)$$

$$t \in (1, \dots, T)$$

where  $y_{it}$  is the dependent variable for individual  $i$  in period  $t$ ,  $X_{it}$  is a vector of explanatory variables other than  $y_{i,t-1}$  (observed heterogeneity),  $\eta_i$  represents unobserved individual-specific factors (unobserved heterogeneity),  $\varepsilon_{it}$  is the observation-specific disturbance and  $(\rho, \beta')$  is the vector of parameters to be estimated. It is assumed that  $y_{i,0}$  is observed. There are two important issues to deal with when estimating a model like this using macroeconomic data: the presence of endogenous and/or predetermined covariates, and the small time-series and cross-sectional dimensions of the typical data set. In what follows, it is briefly discussed the way in which these two problems have been treated in the literature. For future reference, an explanatory variable is called (strictly) exogenous if it is uncorrelated with the observation-specific disturbance at all leads and lags is called predetermined if it is correlated only with past and current observation-specific disturbances (Ciocchini, 2006, p. 1).

There may be some problems about correlation between explanatory variables and the error term and this problem lead to biased estimators. To solve this problem, one way is to use Generalized Methods of Moments (GMM). The concept of GMM is often a simple alternative. If the explicit Maximum-Likelihood functions difficult to derive, the core of the GMM-estimation is the use of orthogonality conditions.

In general GMM can be seen as being especially suited for large data files, while when using only few observations GMM is often less efficient than alternative methods (Behr, 2003, p. 4). In this study, we assess the bias and efficiency of estimators under different data generating process. First one is, the class of instrumental estimators-which is well known GMM estimator and the direct bias correcting estimator - suggested by Kiviet (1995). While in some simulation studies, Judson and Owen (1999), Hansen (2001) a corrected LSDV estimator is found superior compared to GMM-estimators these simulations take no account of System-GMM-

estimators proposed by Blundell and Bond (1998) (Behr, 2003, p. 1). The concept of GMM is often a simple alternative, if the explicit Maximum-Likelihood function is difficult to derive. The core of the GMM estimation is the use of orthogonality conditions. In general GMM can be seen as being especially suited for large data files, while when using only few observations GMM is often less efficient than alternative error term is the point start from:

$$E(X'\varepsilon) = 0$$

Applying this condition to the sample results in the following conditions:

$$\frac{1}{n}X'(y - X\hat{\beta}) = 0$$

Solving this equation for the parameter vector results in the well-known OLS estimator:

$$\hat{\beta} = (X'X)^{-1}X'y$$

In the same fashion the instrumentation can be expressed as an application of the method of moments where use is made of the assumption that the instrument is orthogonal to the error term:

$$\frac{1}{n}Z'(y - X\hat{\beta}) = 0$$

and solving for the parameter vector results in

$$\hat{\beta}_{IV} = b_{2S} = (X'PX)^{-1}X'Py$$

$$P = Z(Z'Z)^{-1}Z'$$

when applying GLS. If the number of instruments equals the number of explanatory variables, the estimator simplifies to

$$\hat{\beta}_{IV} = (Z'Z)^{-1}Zy$$

In this study, we use alternative estimation methods. These are given below:

### ***Least Squares Dummy Variable (LSDV) Estimator***

This estimator is also known as the fixed-effects or within-group estimator. Suppose, it is assumed that the explanatory variables are

strictly exogenous. Estimates of  $\alpha$ ,  $\beta'$  are obtained by applying OLS to the model expressed in deviations from time means: This transformation wipes out the unobserved individual effects, eliminating one possible source of inconsistency: the correlation between  $x_{it}$  and  $\eta_i$ . Shortly, it can be concluded that, for panels with a relatively short time dimension, the use of the LSDV estimator may produce poor results (Ciocchini, 2006, p.3).

### ***The Anderson-Hsiao Estimator***

The estimator suggested by Anderson and Hsiao (1982) is based on the differenced form of the original equation:

$$y_{it} = \rho y_{i,t-1} + \beta x'_{it} + \eta_i + \varepsilon_{it}$$

$$y_{it} - y_{i,t-1} = \rho(y_{i,t-1} - y_{i,t-2}) + (x'_{it} - x'_{i,t-1})\beta + \varepsilon_{it} - \varepsilon_{i,t-1}$$

which cancels the individual fixed effects assumed to possibly correlate with the exogenous variables.

Anderson and Hsiao suggest using level instruments  $y_{t-2}$  or the lagged difference as an instrument for the differenced lagged endogenous regressor. These instruments can be expected to be uncorrelated with the differenced error term:

### ***The Arellano-Bond Estimator***

Arellano and Bond (1991) propose a generalized method of moments (GMM) estimator-henceforth, the AB estimator. They obtain additional instruments from the orthogonality conditions between the lagged values of  $y_{it}$  and the disturbances (Ciocchini, 2006, p. 4). In empirical work using firm level or household panel data GMM suggested by Arellano and Bond has become increasingly popular. The estimator is similar to the estimated suggested by Anderson and Hsiao but exploits additional moment restrictions, which enlarges the set of instruments (Behr, 2003, p. 10).

In the k-explanatory variable case the maximal number of parameters to be estimated is  $T-2 + k(T-1) = (k+1)(T-1)-1$  which determines the number of individuals which has to be available to allow estimation. Because the differencing operation introduces first order autocorrelation into the error term, the first step estimator makes use of a covariance matrix taking this autocorrelation into account.

The two-step GMM estimator uses the residuals of the first step estimation to estimate the covariance matrix as suggested by White (1980):

$$\hat{V} = \sum_{i=1}^N W_i' F_T \hat{\varepsilon}_i F_T W_i$$

The resulting estimator finally is:

$$\hat{\gamma}^{GMM} = (X'W\hat{V}X)^{-1}X'W\hat{V}^{-1}W'y$$

Before analyzing the results of our models, we employ unit root tests.

*Unit Root Tests*

Even though, we use logarithmic values of all variables, unit root may remain. Before estimating the model and utilize unit root tests, we must analyse the panel data types of variables. In Table 1, one can see the panel data identification of the variables that are used in the model.

**Table 1**

*Panel Data Type Identification*

<b>Variables</b>	<b>Panel Data Type</b>
Economic Growth	Unbalanced Panel
Military Expenditures	Unbalanced Panel
Inflation Rate	Unbalanced Panel
Financial Development Level	Unbalanced Panel
Total Government Spending	Unbalanced Panel

As can be seen above, all variables used in the study have unbalanced panel data type. For the unbalanced panel data, the preferred test in the literature is Im, Pesaran and Shin (IPS) unit root test. For this test the model is;

$$y_{i,t} = \alpha_i + \rho_i y_{i,t-1} + \varepsilon_{i,t}$$

The null and alternative hypotheses are defined as:

$$H_0: \rho_i = 1, i = 1, 2, \dots, N$$



Against the alternatives

$$H_1: \rho_i < 1, i = N_1 + 1, N_1 + 2, \dots, N$$

They use separate unit root tests for the N cross-section units. ADF regression is estimated like:

$$y_{i,t} = \alpha_i + \rho_i y_{i,t-1} + \sum_{j=1}^{p_i} \theta_{ij} \Delta y_{i,t-j} + \varepsilon_{i,t}$$
$$t = 1, 2, \dots, T$$

and t-statistic for testing  $\rho_i = 1$  is computed. In principle, the IPS test also can be used in association with any parametric unit-root test, as long as the panel is balanced and all the t-statistics for the unit root in every cross-section are identically distributed so that they will have the same variance and mean.

## Results

Table 2 reports the GMM estimates of the growth regression. We report the estimates of parameters obtained from two different models. The first model is estimated by using fixed effects and the second model is used by using random effects. It is evident from the table that the fixed effects and random effects give similar results. But we only comment on the results of the model obtained from fixed effects.

**Table 2**

*Im, Pesaran and Shin (IPS) Unit Root Test*

<b>Economic Growth</b>	t-bar statistic: 0.55 t-tilde bar statistic:0.50 z-t-tilde bar statistic:0.70 p-value:0.462	Result: cannot be rejected.
<b>Military Expenditures</b>	t-bar statistic: 5.30 t-tilde bar statistic:5.60 z-t-tilde bar statistic:6.55 p-value:0.000	Result: is rejected.
<b>Inflation Rate</b>	t-bar statistic: 6.74 t-tilde bar statistic:6.80 z-t-tilde bar statistic:7.20 p-value:0.000	Result: is rejected.
<b>Financial Development Level</b>	t-bar statistic: 5.99 t-tilde bar statistic:6.21 z-t-tilde bar statistic:6.33 p-value:0.000	Result: is rejected.
<b>Total Government Spending</b>	t-bar statistic: 7.14 t-tilde bar statistic:7.30 z-t-tilde bar statistic:8.02 p-value:0.000	Result: is rejected.

The aim of this study is to analyze the relationship between economic growth and military expenditures of MENA. We find a negative and highly significant effect of infrastructure on economic growth. The coefficient is -0.068 which means a one point increase military expenditure leads to approximately 0.06 point decrease in economic growth. The control variables in the model also have high significance.. We could find this result either from fixed effects or random effects.

**Table 3**  
*Military Expenditure and Economic Growth: GMM Results*

<b>Dependent Variable: GDP Growth</b>			
		<b>Model 1 (GMM-IV-fixed effect)</b>	<b>Model2 (GMM-IV-Ran- dom effect)</b>
GSP(-1)	Coefficient	0.235	0.210
	std-deviation	0.000	0.001
	t-value	240.00	110.00
	p-value	0.000	0.000
Military Expenditure	Coefficient	-0.066	-0.055
	std-deviation	0.000	0.007
	t-value	-58.00	-25.00
	p-value	0.000	0.000
<b>Control Variables</b>			
Inflation Rate	Coefficient	0.148	0.135
	std-deviation	0.001	0.003
	t-value	148.00	45.00
	p-value	0.000	0.000
Financial Development Level	Coefficient	0.085	0.145
	std-deviation	0.006	0.089
	t-value	14.17	1.629
	p-value	0.000	0.156
Total Government Spending	Coefficient	0.147	0.189
	std-deviation	0.056	0.123
	t-value	2.630	1.537
	p-value	0.001	0.150
		0.93	0.92
		0.92	0.91

## Conclusion

A review of the literature on defense economics showed that the debate on the correlation between military expenditures and economic growth went on without a definitive agreement. It could be argued that military expenditures could divert investments from other public and private industries, hence curbing economic growth. However, it could also promote economic growth through Keynesian aggregate demand factors. Also, it is possible that they might not be a correlation between military expenditures and economic growth at all.

In this study the relationship between economic growth and military expenditures of MENA analyzed. The results obtained from study are; a negative and highly significant effect of infrastructure on economic growth exist. The coefficient is -0.068 which means a one point increase military expenditure leads to approximately 0.06 point decrease in economic growth. The control variables in the model also have high significance. In order to sum up, our findings support the literature that finds and highly significant impact of military expenditure on growth in MENA.

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## Özet

Savunma harcamalarının ekonomik büyümeye olan etkisi konusu çok uzun zamandır tartışılan ve araştırılan bir konudur. Ülkelerin güvenliği ile ilişkili bir harcama türü olan savunma harcamaları devletin gerçekleştirdiği bir tam kamusal mal çeşidi olup, gerçekleştirmediği takdirde devletin varlığının sorgulanmasına neden olmaktadır.

Dünyada savunma harcamaları özellikle İkinci Dünya Savaşı'ndan sonra artış göstermiştir. Her ülkenin kendi ekonomik gücü kapasitesinde bir harcama yapma potansiyeli bulunmaktadır. Bu harcamalarda yaşanan

artış gelir potansiyellerine oranla çok daha yüksek olduğunda ise bütçeleri üzerinde ağır bir yük oluşturmaya başlamaktadır. Savunma harcamalarının devlet tarafından gerçekleştirilmemesi düşünülmemeyeceği gibi, bu harcamalardaki aşırı artışın ekonomiye olan etkisi başta gelişmekte olan ülkeler olmak üzere tüm dünyada endişe edilen bir konu haline gelmektedir.

Özellikle Orta Doğu ve Kuzey Afrika Ülkelerinde (MENA) genel olarak bölgede yaşanan siyasal karışıklıklar sebebiyle savunma harcama oranları son yıllarda artış göstermiş ve dünya ortalamasından oldukça yüksek bir seviyeye gelmiştir. Bu bölgedeki ülkelerde yaşanan iç ve dış tehditler harcamaların bu doğrultuda artmasına bir taraftan da ekonomik ve sosyal yapının bozulmasına yol açmıştır.

Savunma harcamalarının ekonomiye olan etkisine ilişkin Keynesyen yaklaşımda; harcamalar toplam talebi, sermaye ve istihdam yaratarak olumlu bir şekilde etkilemektedir. Savunma harcamaları yatırımları atırmakta ve ekonomik büyümeye olumlu katkı sağlamaktadır. Neoklasik yaklaşıma göre ise devletin yaptığı savunmaya yönelik yatırımlar, özel sektör tarafından gerçekleştirilse çok daha karlı ve verimli olabilecektir. Devletin yaptığı savunma yatırımları özel sektör yatırımlarını dışlamaktadır. Yine savunma sanayisi gelişmemiş olan ülkelerin, savunmaya yönelik ihtiyaçları daha çok ithalatla sağlanmaktadır. Bu da ödemeler dengeleri üzerinde yük oluşturmaktadır. Ekonomik açıdan istikrarlı ve güçlü olmayan ülkeler, kamu finansman ihtiyacını; emisyon, borçlanma araçları ile gerçekleştirdiğinde bütçe üzerindeki yük daha da artmakta gelecek nesiller üzerinde de ekstra bir vergi yükü oluşturmaktadır.

Savunma harcamalarının ekonomiye etkisi konusunda yapılmış bir çok çalışma bulunmaktadır. Bu çalışma kapsamında literatür gelişmekte olan ülkeler ile az gelişmiş ülkeler açısından incelenmiştir. Yapılan çalışmaların bir kısmı (Benoit (1973), Hassan vd.(2003), Anwar vd. (2012), Sezgin (2000), Yıldırım vd. (2005), Farzanegan (2012), Halıcıoğlu (2004), Hirnissa et al. (2016), Stroup & Heckelman (2001)) düşük seviyede savunma harcamalarının ekonomik büyümeye katkı sağladığını ancak yüksek seviyedeki harcamaların ekonomik büyümeyi olumsuz etkilediğini belirtmiştir. Çalışmaların bir kısmı savunma harcamalarının ekonomik büyümeye herhangi bir etkisi olmadığını savunmaktadır (Pan vd. (2014), Dunne and Tian (2013), Wijeweera & Webb (2011), Islam (2015), Shahid and Saba (2015)).



Çalışmalardan bazıları da savunma harcamalarının önemli bir şekilde ekonomik büyümeyi olumsuz etkilediğini vurgulamaktadır.( Agostino et al. (2013), Aizenman & Glick (2006)Al-Jarrah (2005), Apanisile & Okunlola (2014), Dunne (2012), Khalid et al. (2015), Dunne and Nikolaidou (2011), Smith (1980), savunma harcamaları gerçekten dış tehditleri önleme amaçlı yapıldığında olumlu, yolsuzluğa neden olacak şekilde kişisel çıkarları korumak adına yapıldığında olumsuz etkisi olduğunu belirtmektedir (Korkmaz (2015), Künü et.al. . (2016), Yang vd. (2011)).

Bu çalışmada da MENA Ülkeleri'nde ekonomik büyüme ve askeri harcamalar arasındaki ilişki panel data analizi ile belirlenmeye çalışılmıştır. Analizden elde edilen sonuçlara göre, savunma harcamalarındaki artış ekonomik büyümeyi olumsuz etkilemektedir.