

The Effect of Military Spending on Economic Growth and Unemployment in Mediterranean Countries

Suna Korkmaz

Bandırma Faculty of Economics and Administrative Sciences
Department of Economics, Balıkesir University,
10200 Bandırma, Turkey. Email: skorkmaz@balikesir.edu.tr

ABSTRACT: One of the necessities of public life and one of the basic elements of the state aiming to fulfill the demands and requirements of individuals which form the community is sovereignty. Sovereignty is separated into two as internal and external. This means, state should provide internal security and peace and also should be able to protect itself against the external threats. In order for a state to achieve these, it has to fulfill the defense services. Due to the unease in Arab regions after Arab spring and as Mediterranean region has strategic importance, 10 countries in Mediterranean region were selected and analysis with panel data was performed for years 2005-2012, in order to examine the effect of military spending of these countries on economic growth and unemployment.

Keywords: military spending; economic growth; unemployment; panel data analysis.

JEL Classifications: C51; E24; F5; H5; O11

1. Introduction

Within the formation of economy, states aimed to fulfill their requirements and also to protect themselves from the threats of other countries. Therefore they always separated a portion for military spending from their budget. Two great wars took place in the world which shattering state economies. The first one was First World War which started in 1914 and ended in 1918 and the second one was Second World War which started in 1939 and ended in 1945. State economies were effected so badly in First World War that it was seen as one of the reasons of global Great Depression in 1930's. During the Cold War between Eastern bloc countries and Western Alliance (NATO) from 1947 to 1991, states assumed each other as threats and increased their defense spending extraordinarily. After ending of Cold War, important decreases occurred in military spending between two unions. Chaos started in some countries in the world after ending of Cold War. Civil wars started in some countries due to ethnic, religious and ideological reasons. We have observed this until today in USSR and in the situation named as Arab spring which started in 2010 and still continues. One of the long term conflicts observed in Middle East is the conflict between Israel and Palestine.

Defense spending is the share separated by states from their national income in order to provide its security against internal and external threats. Defense spending are composed of production (or import from other countries) of tools and vehicles used in defense, repair and maintenance costs for the tools and vehicles, expenditures for R&D activities and the military and civilian staff employed in defense field. Governments arrange the share they separate for defense spending by taking the welfare of their country into consideration. If they feel a threat, they decrease the investments which will increase the welfare of the country and increase defense spending. The effect of defense spending on the economy is one of the most discussed subjects today. Many countries separate more share to defense spending compared to education, health and infrastructure expenditures. In scope of international relations and from the point of view of European Union and France, Mediterranean region has a strategic importance. Due to the instability after Arab spring, especially Maghreb region has a specific importance. Security gap in many Arab countries constitutes a threat for all Mediterranean and Southern Europe. Therefore it is important to examine the defense spending of Mediterranean countries and the effects of these expenditures on their economies.

Starting from Adam Smith who has an important place for the foundations of economy to be continuing till today, many economists have supported free market economy. Because, it has been accepted that free market economy is a mechanism which best ensures economic growth. Government was requested not to interfere in economy but was requested to fulfill some basic duties one of which is homeland security. While governments regulate the public expenditures, they plan the amount of spend to be spared for the fields which are effective on country development. As the security of the country is the subject, the spared ratio for defense spending change from time to time depending on the conflicts in surrounding countries. For this reason a research was conducted in order to determine the effect of ratio spared for defense spending on the development level and the labor situation of the country. In the literature these two factors were generally examined separately. The difference of this study from the others is that the effect of the ratio spared for defense spending (out of public expenditures) on the development level and the labor situation of the country were examined together as a whole.

2. Military Spending and Economic Growth

The Classical school of thought contends that an increase in military expenditure is likely to retard economic growth. This argument is based on the premise that higher military spending implies a lower level of private investment and domestic savings, and lower consumption due to lower aggregate demand. This can be specifically explained as follows. A higher level of military spending will lead to an increase in the interest rate, which will crowd out the private investment. The Keynesian school of thought contends that an increase in the military burden stimulates demand, increases purchasing power and national output, and creates positive externalities (Narayan and Singh, 2007: 395). Endogenous growth theories suggest that government expenditure has an important impact on the long-run growth rate. Its influence depends on the size of government intervention and on the different components of public spending. Moreover, different kinds of government expenditures have heterogeneous effects on economic growth. For example, public infrastructures, research and development and public education are often considered public goods that have a positive effect on economic growth. On the other hand, observations that growth in government spending, mainly based on non-productive spending, is accompanied by a reduction in income growth has given rise to the hypothesis that the greater the size of government intervention the more negative is its impact. Governments have also had a prominent role in financing the military sector. Endogenous growth theory provides a foundation for the relationship between the share of military expenditure and long-run economic growth, predicting an inverse hump-shaped link (Pieroni, 2009: 327).

Cappelen et al. (1984) study used the data are for 17 OECD countries for the period 1960-1980. A simple mathematical model based on economic theory is used to analyze for three relatively homogeneous subgroups of countries. Military spending was generally found to have a negative effect on investment. These two effects have an opposite impact on economic growth. The net effect is that military spending has an overall negative effect on economic growth for the whole sample of countries and for the subgroups, except for the Mediterranean countries.

Alexander (1990) paper models the effect of military spending on economic growth by specifying four sectoral production functions. The model is confronted with data from a group of developed countries. It is concluded that the gross effect of military spending on growth is neither significantly positive nor negative, although the defence sector is substantially less productive than the “rest” of the economy. DeRouen Jr (1994) study differs from those by considering the relationship between “guns and growth” over time, and by looking at both the overall and externality effects of military spending. The findings demonstrate that defense spending has both positive and negative impacts on economic growth in Latin America, but that there is no net positive effect. Dunne (2002) paper has provided a contribution to the debate on the economic effects of military spending on economic growth, focusing upon a sample of small industrialising economies. The data is used to consider the individual economies and to provide some panel time-series results, which show some evidence of a negative impact of military spending on growth and investment.

Kollias et al. (2004) paper examines the relationship between military expenditure and growth among the EU15 members using co-integration and causality tests for the period 1961–2000. Their results reported that the apparent prevalence of the direction of causality from growth to military expenditure. Yildirim et al. (2005) paper examines empirically the effects of military expenditures on

economic growth for Middle Eastern countries and Turkey, for the time-period 1989–1999. The relationship between military expenditure and economic growth is investigated by using cross-section and dynamic panel estimation techniques. Empirical analysis indicates that military expenditure enhances economic growth in the Middle Eastern countries and Turkey as a whole. Lee and Chen (2007) paper used up-to-date data for 27 OECD countries and 62 non-OECD countries for the 1988–2003 period. The long-run panel regression parameter results, such as the fully modified OLS, indicate that a positive relationship between GDP and ME only holds for OECD countries, whereas a negative relationship from ME to GDP only exists in non-OECD countries.

Chang et al. (2011) applied GMM method to panel data of 90 countries spanning over 1992–2006. Their results indicate military spending leads negatively economic growth for the panels of low income countries. Of four different regional panels, a negative but stronger causal relationship from military expenditure to economic growth is found for the Europe and Middle East–South Asia regions. Wijeweera and Webb (2011) study used a panel co-integration in the five South Asian countries of India, Pakistan, Nepal, Sri Lanka and Bangladesh over the period of 1988–2007. They found that a 1% increase in military spending increases real GDP by only 0.04%, military spending in these countries has a negligible impact upon economic growth.

Yang et al. (2011) paper the main objective is to decipher the military expenditure–economic growth relationship, taking the level of economic development (income) into consideration. Their findings: (i) military expenditure has a significantly negative relationship to economic growth for the 23 countries with initial incomes (threshold variable) less than or equal to \$475.93; (ii) when the threat level is heightened, economic growth (23 countries) is expected to decrease. Dunne and Tian (2013) employed an exogenous growth model and dynamic panel data methods for 106 countries over the period 1988–2010. They found that military burden has a negative effect on growth in the short and long run.

Pradhan et al. (2013) paper overcomes these deficiencies by deploying dynamic multivariate–causality tests applied to data from 22 countries over the period 1988–2012. They found equilibrium relationships between military expenditure and economic growth. Pan et al. (2014) study revisits the causal relationship between military spending and economic growth in 10 Middle East countries via a panel causality analysis. Their results indicate unidirectional causality from military spending to growth for Turkey; one-way causality from economic growth to military spending for Egypt, Kuwait, Lebanon, and Syria; bidirectional causality for Israel; and no causality in either direction for Jordan, Oman, and Saudi Arabia.

Chang et al. (2014) study revisits the causal linkages between military spending and economic growth in China and G7 countries (i.e. Canada, France, Germany, Italy, Japan, the UK, and the USA) by focusing country-specific analysis for the period 1988–2010. Their results find evidence of the military spending–growth detriment hypothesis for both Canada and the UK, and one-way Granger causality running from economic growth to military spending for China. They found a feedback between military spending and economic growth in both Japan and the USA. Aye et al. (2014) used full sample bootstrap Granger non-causality tests and no Granger causal is found between military expenditure and GDP for 1951–2010 in South Africa.

3. Military Spending and Unemployment

Dunne and Smith (1990) paper considers evidence from the simple dynamic reduced form regressions estimated on long historical series for the US and the UK and pooled post-war data for 11 OECD countries. It does not suggest that the share of military expenditure is a significant influence on the unemployment rate. Payne and Ross (1992) examine the effect of defence spending on the unemployment rate covering a quarterly time frame 1960:1 to 1988:1 using an unrestricted vector autoregression framework. Their results show that no causal relationship in either direction between defence spending and unemployment rate. Hooker and Knetter (1994) use data on a panel of states over a 30 year sample to estimate the response of unemployment to military procurement spending. Their main finding is that changes in procurement spending significantly effect unemployment in states heavily dependent on the military sector and subject to large such changes, and that accounting for this variation in responses across states adds approximately 40% to the estimated aggregate unemployment impact of the current drawdown.

Paul (1996) estimated a three-equation model in 18 OECD countries during the period 1962-1988. Defence spending has a favourable impact on unemployment rate in Germany and Australia, whereas in Denmark it worsens the employment situation. In Australia, Germany and Belgium, non-defence spending and the unemployment rate are causally independent. Defence spending appears to act as a stabilization tool in response to changes in the unemployment rate only in the UK. No significant causal relationship between unemployment rate and either type of spending is revealed in Japan, The Netherlands, Italy, Spain, Austria, New Zealand, Sweden, Canada and the USA.

Dunne and Watson (2000) paper adds to the debate by examining the long run relationship between military burden and manufacturing employment in South Africa. They found that evidence supporting the view that military expenditure will have a detrimental impact on long term manufacturing employment, adversely affecting industrial structure and efficiency.

Yildirim and Sezgin (2003) represent that military spending would increase employment that spending on the armed forces may generate increased demand in the economy. However, military expenditure devoted to high-technology labour saving weapon systems can be expected to increase unemployment. Employment equation is specified using a CES production function and modelled employing ARDL technique. Their findings indicate that military expenditure negatively effects employment in Turkey.

Huang and Kao (2005) paper study herein adopts official time series data of yearly defence spending, employment in the private sector, GDP, average monthly salary from 1966 to 2002, The main finding of their study is that defence spending is able to benefit the employment situation in the long run, but damages employment in the short run.

Tang et al. (2009) used a panel data version of the Granger causality test is applied on 46 countries. The results indicate that there is little evidence of the causality running from unemployment to military expenditure. In contrast, the causality running from military expenditure to unemployment receives empirical support if military expenditure is measured in terms of its share of GDP and if data are taken from middle- and low-income countries or non-OECD countries.

Malizard (2014) study estimation is based on the ARDL approach to cointegration between 1975 and 2008. The results reveal that both defense and non-defense spending exert a negative influence on unemployment but that defense spending has a higher negative impact.

The conclusions obtained from studies made about military spending, economic growth and unemployment can be summarized as follows; In studies made by DeRouen Jr (1994), Dunne (2002), Chang et al. (2011), Yang et al. (2011), Dunne and Tian (2013) it was stated that military spending negatively effect economic growth, in studies made by Yildirim et al. (2005), Lee and Chen (2007), Wijeweera and Webb (2011) it was stated that military spending positively effect economical growth. In studies made by Pradhan et al. (2013), Pan et al. (2014), Chang et al. (2014) a causality relation between military spending and economic growth was found. In studies made by Dunne and Smith (1990), Payne and Ross (1992) no causality relation could be found between military spending and unemployment while Hooker and Knetter (1994) and Tang et al. (2009) revealed that there is a causality relation between these two variables. Dunne and Watson (2000), Yildirim and Sezgin (2003), Huang and Kao (2005) concluded in their empirical analyses that military spending adversely effect employment.

4. Data, Methodology and Results

In this study, it was analyzed whether or not military expenditure had effect on economic growth (GDP) and unemployment for selected 10 Mediterranean countries (Spain, Bosnia-Herzegovina, Croatia, Egypt, France, Greece, Israel, Italy, Turkey and Slovenia) by using the annual data of 2005-2012. Panel data analysis was used as a method. Forecasts were made with Stata 12.

Military Expenditure (% of GDP): Military expenditures data from SIPRI are derived from the NATO definition.

GDP definition is used annual growth rates (%): Annual percentage growth rate of GDP at market prices based on constant local currency. Aggregates are based on constant 2005 U.S. dollars.

Unemployment, total (% of total labor force) (modeled ILO estimate): Unemployment refers to the share of the labor force that is without work but available for and seeking employment.

Military expenditures, GDP and unemployment datas were taken from World Bank website.

A panel data regression differs from a regular time-series or cross-section regression in that it has a double subscript on its variables, i.e. (Baltagi, 2005: 11)

$$y_{it} = \alpha + X'_{it}\beta + u_{it} \quad i=1, \dots, N; \quad t=1, \dots, T \quad (1)$$

with *i* denoting countries, and *t* denoting time. The *i* subscript, therefore, denotes the cross-section dimension whereas *t* denotes the time-series dimension. α is a scalar, β is $K \times 1$ and X_{it} is the *i*th observation on *K* explanatory variables.

Before proceeding to forecasts, for the purpose of enabling forecasts to give correct results and avoiding misleading regression, it was analyzed whether or not the variables were stationary. First, unit root tests were conducted according to the Levin–Lin–Chu test. Levin–Lin–Chu unit root test results are shown in Table 1.

Table 1. Levin-Lin-Chu Unit Root Test

Variables	Intrinsic Correlation Delay	p value	Test Result(*)
ME	1	0.000	There is no unit root
UE	1	0.001	There is no unit root
GDP	1	0.000	There is no unit root

Note: As a result of the Levin–Lin–Chu unit root test, it was decided that there was a unit root when the p value was found to be above 5%. In other case, it was decided that there was no unit root.

According to results in Table 1, military expenditures, gdp and unemployment series became stationary at level. In order to make sure whether or not the variables in the model had a unit root, unit root tests were performed according to the Im-Pesaran-Shin test in addition to the Levin–Lin–Chu test. The results are given in Table 2.

Table 2. Im-Pesaran-Shin Unit Root Test

Variables	Intrinsic Correlation Delay	p value	Test Result(*)
ME	0	0.158	There is unit root
Δ ME	0	0.009	There is no unit root
GDP	0	0.345	There is unit root
Δ GDP	0	0.003	There is no unit root
UE	0	0.999	There is unit root
Δ UE	0	0.467	There is unit root
$\Delta\Delta$ UE	0	0.023	There is no unit root

Note: As a result of the Im-Pesaran-Shin unit root test, it was decided that there was a unit root when the p value was found to be above 5%. In other case, it was decided that there was no unit root.

As seen in Table 2, while military expenditure and economic growth were stationary at first difference, unemployment data became stationary in its second difference. I use the Breusch and Pagan Lagrangian Multiplier test to learn whether our model is a pool model or a random effect model.

According to the BP LM test, probability (p) value was found as 0.041. On the grounds that the probability value is below 5%, H_0 hypothesis is rejected. As H_0 hypothesis is not accepted, Hausman test should be conducted. Probability value was found 0.044 as a result of the Hausman test. Since probability value is smaller than 5%, the hypothesis H_0 is rejected. In other words, I can say that there are no random effects. However, there may be fixed effects in the model. A dynamic fixed effects model of the form (Judson and Owen, 1999: 10);

$$y_{i,t} = \gamma y_{i,t-1} + x'_{i,t}\beta + \eta_i + \varepsilon_{i,t} \quad ; \quad |\gamma| < 1 \quad (2)$$

where η_i is a fixed-effect, $x_{i,t}$ is a $(K-1) \times 1$ vector of exogenous regressors and $\varepsilon_{i,t} \sim N(0, \sigma_\varepsilon^2)$ is random disturbance. The following is assumed:

$$\begin{aligned} \sigma_\varepsilon^2 > 0 \\ E(\varepsilon_{i,t}, \varepsilon_{j,s}) &= 0 \quad i \neq j \text{ or } t \neq s \\ E(\eta_i, \varepsilon_{j,t}) &= 0 \quad \forall i, j, t \\ E(x_{i,t}, \varepsilon_{j,s}) &= 0 \quad \forall i, j, t, s \end{aligned} \quad (3)$$

The fixed effects model is a common choice for macroeconomists. It is generally more appropriate than a random effects model for many macro datasets for two reasons. First, if the individual effect represents omitted variables, it is highly likely that these country specific characteristics are correlated with the other regressors. Second, it is also fairly likely that a typical macro panel will contain most of the countries of interest and, thus, will be less likely to be a random sample from a much larger universe of countries. Random-effects models treat the effects size parameters as if they were a random sample from a population of effect parameters and estimate hyperparameters (usually just the mean and variance) describing this population of effect parameters. Although inference procedures based on these models have been available for well over a decade, there is still considerable confusion about the differences between them (Hedges and Vevea, 1998: 486).

Hausman test was conducted with the intent of testing the presence of fixed effects. When I performed the Hausman test, probability value was found as 0.041. On the grounds that this value is below 5%, H_0 hypothesis, which gives the statement of pooled, is rejected. The alternative hypothesis which indicates that there are fixed effects is accepted. At the next stage, it was evaluated whether or not the model had autocorrelation or heteroscedasticity. H_0 hypothesis, which shows that there is no autocorrelation, is accepted because the probability value is 0.121 according to the Wooldridge autocorrelation test and consequently the probability value is above 5%. In the heteroscedasticity test, probability value was found as 0.000. On the grounds that this value is below 5%, H_0 hypothesis, which shows that there is no heteroscedasticity, is rejected. In order to make the model free from heteroskedasticity, AR1 process and single lag OLS of residuals method were applied. As a result of the AR1 process, probability value was found as 0.560. On the grounds that the result is above 5%, the problem of heteroskedasticity was eliminated. Whether there is a problem of multiple-linear correlation was tested. The mean VIF value was found 1.32. Since it is smaller than 5%, it is seen that there is no problem of multiple correlation.

Upon eliminating all problems, the results of $\Delta ME = \beta_0 + \beta_1 \Delta GDP + \beta_3 \Delta \Delta UE + u_t$ of my model, which was analyzed with fixed effects, are shown in Table 3.

Table 3. Panel Results for 10 Mediterranean Countries

Variables	Coefficient	p Value
ΔGDP	-0.009	0.018
$\Delta \Delta UE$	0.013	0.104
Constant (C)	-0.087	0.000

According to the results in Table 3, it is seen that the variables of GDP and unemployment is 10% statistically significant for 10 Mediterranean countries. While military spending effect economic growth negatively it affects unemployment positively.

In order for the countries to ensure or maintain the development level, the shares spared from public expenditures for education, health and infrastructure services should be increased. However the countries try to increase defense spending against the possible threats from surrounding countries. As the economic sources are not shifted to the fields which will be effective in development of country, (this is also supported by the analysis results) military spending negatively effect the economic growth of the country. In the literature similar results were obtained in the studies made by DeRouen Jr (1994), Dunne (2002), Chang et al. (2011), Yang et al. (2011), Dunne and Tian (2013) while opposite results were obtained in the studies made by Cappelen et al. (1984), Yildirim et al. (2005), Lee and Chen (2007), Wijeweera and Webb (2011). As the share spared for military spending from the government budget increases the sources in the economy cannot be used efficiently and the usage of labor force in productive fields is prevented. When most of the income generated in the country is not spared for investments, unemployment increases accordingly. As a result of the empirical analysis, it was concluded that military spending increase unemployment. This result is also supported by the studies made by Dunne and Watson (2000), Yildirim and Sezgin (2003), Huang and Kao (2005).

5. Conclusion and Policy Implications

The effects of military spending on economic growth and unemployment variables (macroeconomic variables) of 10 Mediterranean countries which are assumed to be regionally important were examined by using panel data analysis. As for the period 2005-2012 years has been taken. According to the analysis results while military spending effect economic growth of countries negatively, it increases unemployment.

While governments plan their expenditures, they mostly try to take the fields that will contribute to the development of countries into consideration. However due to the unrest faced in countries close to Mediterranean region, importance of country security increases. Governments separate big shares to defense spending from their budgets. This will force them to separate less resource to investments in education, health and infrastructure fields which will contribute to country development. This will slow down economic growth. In production of defense products more R&D activities and resources are required. As qualified staff will be needed in this sector, employee turnover rate will be low. This will be a factor limiting employment in other sectors. The conversion of some defense industries to civil production is limited or does not exist at all. The inefficient use of buildings, institutions and production capacity established for defense industry will cause resource waste in economic terms. Besides in globalizing world, the capital movements between countries take important place. While capital moves between countries the trust and stability environment in countries is taken into consideration. Foreign direct investment and indirect investments flow to countries where trust and stability environment is ensured. Trust and stability environment in countries is one of the most important elements affecting economic growth. As a result of armament efforts of countries which lack political and military stability, defense spending creates pressure on budget revenues and direct governments to external debt, thus decreasing social welfare. The military spending in developing countries are rather on import basis so they create a negative effect on balance of payments. As a result of the analysis performed in this study, it is observed that military spending effect the economic growth of countries negatively. For this reason, countries should create a more peaceful environment, decrease their defense spending and shift their investment resources to other areas which will ensure their economic growth.

The distribution of limited economic resources to defense, goods and services depends on the conditions of the current economy. As emphasized by Keynes, at first glance it is assumed that the increase in defense spending will trigger the total demand in the economy and thus contribute to economic growth. However, the sources spared to defense spending are taken from alternative usage areas which may be important for growth; this may have negative impact on production capacity. As generally advanced technology is used in defense industry, the production requires intensive capital and qualified labor force. It can also be said that defense spending are not very effective in increasing employment. If the investments made in defense industry serve civilian sector as well, this may have an increasing effect on employment.

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