



Conflict, Defense Spending and Economic Growth in the Middle East: A Panel Data Analysis

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ABSTRACT

The relationship between defense spending and economic growth is an active topic of debate for a long time. Defense spending may have negative consequences on the growth performance of developing countries in such conflict-ridden areas as the Middle East. This study is conducted to investigate the effects of defense spending on economic growth in a panel of twelve Middle Eastern countries over the period 1998-2012. The approach suggested by Swamy and Arora (1972) was employed for the empirical study. Findings of the empirical study suggest that defense spending has a negative effect on economic growth, which aggravates during times of internal and external conflicts.

Keywords: Defense Spending, Economic Growth, Conflict, Middle East

JEL Classifications: E60, F52, H56

1. INTRODUCTION

Whether governments can achieve economic growth by means of increasing defense spending is an ongoing topic of discussion which has been busying the minds of economists for a long time. As to the Keynesian view, defense spending has a positive impact on economic growth through a stimulation of aggregate demand, by triggering a rise in capital stock utilization, employment, profits and thereby creating an increase in investments. Defense spending may have positive effects on growth, by creation of such hard infrastructure as roads, buildings, bridges, etc. and by development of technologies that can also be productively used in the private sector. In contrast, neoclassical view argues that defense spending negatively affects economic growth, by crowding-out private sector through channeling resources, which may otherwise be more productive in the private sector, to defense and related sectors. In case where national defense sector is not developed, national defense is highly dependent on imports of defense goods. This may also have negative growth consequences by increasing external debt and transferring valuable resources to abroad.

Empirical research on the defense spending-economic growth relationship has produced conflicting results so far, depending on the sample of country or groups of countries selected, the econometric model or approach or the data set used for the study. The literature on the subject is rich with studies on developing countries as well. With research on such developing areas like Sub-Saharan Africa or South East Asia, where conflicts are common, and on rival neighbors, such as Greece and Turkey or Pakistan and India. However, there are several studies which focus on the Middle East alone, a region which is ridden with serious conflicts and political tensions. The Middle East is often included in panel studies containing many countries as “The Middle East and North Africa.”

This study aims to investigate defense spending-economic growth relationship in the core of the Middle East, where security is a constant concern. In this respect, a panel of twelve Middle Eastern countries including Bahrain, Egypt, Iran, Israel, Jordan, Lebanon, Oman, Turkey, Kuwait, United Arab Emirates, Yemen and Saudi Arabia¹ were selected and Panel Data approach were

¹ Iraq, Qatar and Syria were excluded from the panel due to data issues.

applied to data over the period 1998- 2012 to test the nature of defense-growth relationship. The effects of internal and external conflicts on defense spending and economic growth were also checked for in order to have a picture of the contribution of defense spending on national economies. As it was pointed out by Dunne et al. (2004: 181), demand for higher defense spending may have serious macro consequences if increased military spending is financed by increasing money supply, borrowing from abroad or from within the country, or by depleting foreign exchange stocks. Moreover, there may be indirect effects of defense spending on external indebtedness through purchase of expensive advanced technologies or intermediate goods required by the domestic defense industries from abroad (Günlük-Senesen, 2004: 147).

The study is structured as follows: The second section of the study includes a literature survey on the defense spending-economic growth nexus. Data and methodology are explained in the third section. Empirical results are provided in the fourth section of the study. Elaborations are made and some recommendations are given in the final and concluding section.

2. LITERATURE SURVEY

The nature of defense spending-economic growth relationship has been a hot topic for researchers. There are studies are conducted for individual countries which are known to have conflict or security issues. There is also a rich vein of literature focusing on panels of developing countries or countries situated in certain regions around the world.

As for the former group, Karagianni and Pempetzoglu (2009) ran both linear and nonlinear Granger causality tests to investigate defense-growth relationship for Turkey over the period 1949-2004. Linear Granger causality test implied a unidirectional relationship from economic growth to defense spending. Applying nonlinear Baek and Brock (1992) test modified by Hiemstra and Jones (1994), Karagianni and Pempetzoglu (2009) obtained a unidirectional causal relationship running from defense spending to economic growth. Feridun et al. (2011) applied ARDL approach of Pesaran et al. (2001) and Granger causality test to investigate the effects of military spending on economic growth of self-proclaimed Turkish Republic of Northern Cyprus over the period 1997-2007. They have found a unidirectional relationship running from defense expenditures to growth in North Cyprus while Kollias et al. (2004) found an instantaneous bidirectional relationship for South Cyprus. Wolde-Rufael (2009) applied bounds test and Granger causality test to data over the period 1970-2005 for Ethiopia to obtain a positive unidirectional causality between defense spending and external debt and a negative relationship between growth and external debt. Shahbaz and Shabbir (2012) tested the defense-growth relationship for Pakistan over the period 1971-2009 using ARDL approach of Pesaran et al. (2001), while also checking for the stability of the cointegration relationship using a rolling window approach. They have obtained a negative impact of defense spending on economic growth, with the direction of causality is from defense spending to economic growth. On the other hand, Shahbaz et al. (2013)

used Pesaran et al. (2001) approach and vector error correction model for Pakistan to conclude that there is a positive relationship running from defense spending to external debt and a negative unidirectional relationship from economic growth to debt over the period 1973-2009.

There are also a number of single-country studies testing the defense-growth relationship for different countries in the Middle East. Using a nonlinear least squares approach on 1953-1992 data for Israel, DeRouen (2000) concluded that non-defense government spending have a more sound positive effect on growth than the defense spending, particularly in the short-run. Sezgin (2004) applied Engle –Granger causality test on data over the period 1979-2000 to test defense spending-external relationship in Turkey. Although the sign of the relationship is not clear in the long-run, Sezgin (2004) found that defense spending is increasing Turkish external debt in the short-run for the studied period. Al-Jarrah (2005) tested the relationship for Saudi Arabia for 1970-2003 period, first checking for the effect of defense spending on overall real gross domestic product (GDP), and then on non-oil real GDP in order to isolate the effects of oil revenues. Using Johansen (1988) cointegration test and Granger causality tests, Al-Jarrah (2005) found a bidirectional causality between defense spending and economic growth and unidirectional causality running from non-oil economic growth to defense spending; with the effects of defense spending is negative and stronger in the short run. Karagol (2006) studied the relationship between defense spending, external debt and economic growth in Turkey. Running Johansen test, Karagol (2006) estimated impulse-response functions and variance decompositions to find a positive relationship between defense spending and external debt. Duella (2014) investigated the relationship for Algeria using 1988-2010 data. Applying Johansen Cointegration test, he concluded that there is a unidirectional causality running from military spending to economic growth, with the overall effect being negative in the long-run. Abu Al-Foul (2014) employed Toda and Yamamoto (1995) approach to find out that there is a unidirectional relationship running from defense spending to economic growth in Jordan over the 1988-2007 period.

As an example of mixed results in the literature, using a data set for the 1992-2006 period and grouping countries as to their income levels and geographical regions, Chang et al. (2011) applied the Generalized Method of Moments (GMM) approach proposed by Arellano and Bond (1991) to a panel of 90 countries. Chang et al. (2011) found that military spending negatively causes economic growth in the Middle East-South Asia and Europe regions. Using a two-step GMM approach, Chen et al. (2014) found mixed results for different countries, grouped as to their income levels, economic bloc status (OECD, G7, Asia and Europe) and geographical locations. Chen et al. (2014) concluded that there is short-run bidirectional causality between defense spending and economic growth in the Middle East and North Africa region.

There is a rich literature focusing on groups of Asian countries as well. Hirnissa et al. (2009) investigated the relationship for ASEAN-5 countries over the period 1965-2006 applying

Pesaran et al. (2001) bounds test and Stock and Watson (1993) dynamic ordinary least squares (OLS) approach. They have found a bidirectional relationship for Singapore, a unidirectional relationship from defense spending to growth in Indonesia and Thailand and no relationship in Malaysia and Philippines. In another study on a panel of five other South Asian countries for 1988-2007 period, Pradhan (2010a) used Johansen cointegration test and Pedroni (2004) cointegration test, finding long-run unidirectional causality from economic growth to defense spending in Indonesia, Malaysia, Singapore and Thailand and a bidirectional causality in Philippines. In addition to India and Pakistan, Wijeweera and Webb (2011) tested the long-run relationship between military spending and economic growth for three more South Asian countries of Nepal, Sri Lanka and Bangladesh using data from the 1988-2007 period. Employing Augmented Dickey-Fuller, Kao Residual cointegration and Johansen-Fisher Panel Cointegration tests and Granger causality test in a fixed effect model, they have found that, although minimal, military spending has a positive effect in this group of countries; with a 1% increase in military spending causing a 0.04% increase in growth. In another study conducted by Safdari et al. (2011), using Pesaran et al. (2001) and Toda and Yamamoto (1995) approaches for a panel of South Korea, Malaysia, Iran and Saudi Arabia over the period 1988-2006, no relationship was found for Iran and Saudi Arabia, while a unidirectional relationship from growth to defense spending obtained in South Korea and vice versa in Malaysia.

Majority of the literature consists of studies conducted on groups of countries in which the Middle East is usually included in general groups of developing countries or larger regions such as Middle East and North Africa. The relationship between defense spending and economic growth may also show differences according to the geographical location of countries as the state of spatial relations, especially those between neighbors, such as conflict or peace, may have an impact on military expenditure. In this respect, including the core of the Middle East in enlarged regional contexts for research might not produce focused results, as regional proximity may induce increases in defense spending due to heightened regional risks or expectations of threat from nearby countries. Highlighting this line of thinking, Yildirim et al. (2011) used Augmented Feder – Ram and Solow defense – growth models in a data set of 133 countries for the 2000-2008 period. In both models, Yildirim et al. (2011) obtained statistically significant effects of military spending on growth that are affected by spatial patterns. In the same fashion, Pradhan (2010b) reached to the conclusion that geographical proximity of countries can affect each other's defense spending. Using Johansen and Pedroni approaches to test for the relationship between defense spending and economic growth in China, India, Pakistan and Nepal for the period 1988-2007, Pradhan (2010b) found mixed results for the studied countries; while a unidirectional causality between defense spending and economic growth exists in China and Nepal, the direction of the relationship is, however, is not clear for India and Pakistan.

There are also a limited number of studies focusing solely on the Middle Eastern countries. Lebovic and Ishaq (1987) used

OLS and two stage least squares methods on 1973-1982 data and reached out to the conclusion that defense spending is negatively effecting economic growth in the Middle East. Investigating the causal relationship between defense spending and growth in six Gulf countries over the period 1975-1998, Al-Yousif (2002), using Granger causality test within a multivariate error correction model framework has found mixed results for each of the studied countries. Abu-Bader and Abu-Qarn (2003) used multivariate Johansen cointegration test and Granger causality tests to check for causality between military spending and economic growth in Egypt, Israel and Syria. They concluded that the military spending has a negative effect on growth in these countries in the long-run. Yildirim et al. (2005) tested the relationship for Turkey and Middle East countries using fixed effects model and Arellano and Bond (1991) GMM technique over the period 1989-1999, finding a positive impact of defense spending on growth in the studied panel of countries. Smyth and Narayan (2009) used multiple cointegration tests for Bahrain, Iran, Jordan, Oman, Syria, Yemen over the period 1988-2002 to show that there is a positive relation between defense spending and external debt. Using bootstrap panel causality test approach of Kónya (2006), Pan et al. (2014) studied the relationship between 10 Middle Eastern countries for the period 1988-2010. They found mixed results for different countries in the panel. Abu-Qarn (2010) studied the effects of defense spending on economic growth in Israel and its Arab rivals of Egypt, Syria and Jordan for the 1960-2004 period using Toda and Yamamoto (1995) approach and generalized variance decomposition, finding weak causality from defense spending to economic growth or no causality.

3. METHODOLOGY AND DATA

Annual data from the sample period of 1998-2012 for twelve Middle East countries; Bahrain, Egypt, Iran, Israel, Jordan, Lebanon, Oman, Turkey, Kuwait, United Arab Emirates, Yemen and Saudi Arabia were used in this study. A GDP-growth model including seven variables was established for the Middle Eastern countries mentioned above. Following the literature, we obtained four models to measure the effects of defense spending on economic growth:

$$\text{Model 1} = Gdp_{it} = f(Def_{it} + Pop_{it} + Fdi_{it} + Cor_{it}) \quad (1)$$

$$\text{Model 2} = Gdp_{it} = f(Def_{it} + Pop_{it} + Fdi_{it} + Cor_{it} + Int_{it}) \quad (2)$$

$$\text{Model 3} = Gdp_{it} = f(Def_{it} + Pop_{it} + Fdi_{it} + Cor_{it} + Ext_{it}) \quad (3)$$

$$\text{Model 4} = Gdp_{it} = f(Def_{it} + Pop_{it} + Fdi_{it} + Cor_{it} + Int_{it} + Ext_{it}) \quad (4)$$

$$i=1, \dots, N \quad t=1, \dots, T,$$

where Gdp_{it} is the rate of economic growth of country i at time t , measured as the GDP (at constant 2005 US dollars), Def_{it} represents the defense spending of country i (hence; Def_{it}/Gdp_{it} is rate of defense spending of country i to its GDP at a given time t), Pop_{it} is population growth rate, Fdi_{it} represents the rate of foreign direct investment (FDI) to Gdp_{it} , Cor_{it} is country i 's corruption index value at time t , In_{it} and Ex_{it} are country i 's internal conflict index

and external conflict index values at time t , respectively. Table 1 shows a list of dependent and independent variables used in this study and their respective sources. GDP, FDI and population data are taken from The United Nations Conference on Trade and Development Yearbook, 2014; Defense spending is taken from Stockholm International Peace Research Institute Yearbook, 2015 and external and internal conflict variables are taken from International Country Risk Guide (ICRG) Yearbook, 2012.

As explained by ICRG (2012); internal conflict index value is an assessment of political violence in any country. The highest rating represents that there is no armed or civil opposition to the government while the lowest rating represents that there is an on-going civil war. On the other hand, external conflict index value is an assessment of the risk to the incumbent government from foreign action, including non-violent external pressure, withholding of aid, trade restrictions, territorial disputes, sanctions, etc.

The analysis of panel data is the subject of one of the most active in econometric literature because of the fact that panel data provide such a rich environment for the development of estimation techniques and theoretical results (Greene, 2012: 344). Thus, we preferred to use a panel data approach to measure impacts of defense spending. Fixed effects model and random (generalized least square) effects model are the most preferred analyses by researchers. The crucial appropriation between fixed and random effects is whether the unobserved individual effect embodies elements that are correlated with the regressors in the model; whether these effects are stochastic or not (Greene, 2012: 347; Baltagi, 2005: 19). In this study, we use a one-way random effect model in order to research impacts of defense spending on economic growth. Therefore, we add the error terms to the models stated above and rewrite the equations as below:

$$\text{Model 1} = gdp_{it} = a_{it} + \beta_1 def_{it} + \beta_2 pop_{it} + \beta_3 fdi_{it} + \beta_4 cor_{it} + \beta_5 Dummy_{it} + u_{it} + \varepsilon_{it} \quad (5)$$

$$\text{Model 2} = gdp_{it} = a_{it} + \beta_1 def_{it} + \beta_2 pop_{it} + \beta_3 fdi_{it} + \beta_4 cor_{it} + \beta_5 in + \beta_6 Dummy_{it} + u_{it} + \varepsilon_{it} \quad (6)$$

Table 1: Description of the variables

Variable	Description	Databank
GDP	Real economic growth rate	UNCTAD
FDI	Rate of real foreign direct investment (2005\$)/ Real GDP (2005\$)	UNCTAD
Population	Population growth rate	UNCTAD
Defense spending	Rate of real defense Spending (2005\$)/ Real GDP (2005\$)	SIPRI
Corruption Dummy variable	Corruption Index Dummy variable for 2009 financial crisis	ICRG, 2012-Table 3B -
Internal conflict	Internal conflict index	ICRG, 2012-Table 3B
External conflict	External conflict index	ICRG, 2012-Table 3B

GDP: Gross domestic product, FDI: Foreign direct investment, UNCTAD: United Nations Conference on Trade and Development, SIPRI: Stockholm International Peace Research Institute, ICRG: International Country Risk Guide

$$\text{Model 3} = gdp_{it} = a_{it} + \beta_1 def_{it} + \beta_2 pop_{it} + \beta_3 fdi_{it} + \beta_4 cor_{it} + \beta_5 ex + \beta_6 Dummy_{it} + u_{it} + \varepsilon_{it} \quad (7)$$

$$\text{Model 4} = gdp_{it} = a_{it} + \beta_1 def_{it} + \beta_2 pop_{it} + \beta_3 fdi_{it} + \beta_4 cor_{it} + \beta_5 in + \beta_6 ex + \beta_7 Dummy_{it} + u_{it} + \varepsilon_{it} \quad (8)$$

$$i=1, \dots, N \quad t=1, \dots, T,$$

where u_{it} is the cross-section effect, ε_{it} represents error term and $Dummy_{it}$ is dummy variable for global financial crisis of 2009.

In this study, we use Hausman (1978) test to select the most effective model. Moreover, while estimating, we follow Swamy and Arora (1972), who suggest running two regressions to get estimates of the variance components from the corresponding mean square errors of these regressions. The first regression is “within regression” and the second regression is “between regression” (Baltagi, 2005:16).

4. EMPIRICAL RESULTS

We apply Hausman test to decide between fixed effects and random effects models. The value of Hausman test is not significant, which means that random effects model is the best choice for analysis when compared to fixed effects model. Therefore, only the results of random effects model are given in Table 2. Since random effects estimator is biased, robust standard errors must be generated. Thus, the method developed by Arellano (1987), Froot (1989) and Rogers (1993) was used for the robustness check of the study.

As seen Table 2, Wald Chi-square statistic which belongs to Model 1 is 82.47 and significant, which means Model 1 is fit. Coefficients of defense spending, corruption and population growth variables are -0.149 , 0.001 and -0.006 , respectively, and z-values for these variables are -3.73 , 0.29 and -0.15 , respectively, meaning just defense spending is statically significant. These results suggest that corruption and population growth are not correlated with growth. On the other hand, FDI is highly positively correlated with economic growth; its coefficient is 0.22 and z-value is 6.07 , which means that coefficient of FDI is statically significant at 1%. Dummy variable for global crisis is also negatively correlated with economic growth and statically significant at 1%.

In Model 2, we add internal conflict as a control variable. Diagnostic statistics of R^2 and Wald statistic for Model 2 are 0.14 , 191.55 respectively. After adding internal conflict, defense spending is negatively correlated with economic growth; its coefficient is -0.226 and z-value is $-0.4.01$, meaning that coefficient is statically significant at 1%. Moreover, FDI and internal conflict are statically significant at 1% level.

In Model 3, we check for the effects of external conflict. Coefficient of defense spending is negative and statically insignificant. FDI and external conflict are positively correlated and significant at 1% level. In our last model, we include external and internal conflict in Model 1. Here, defense spending is negatively correlated with economic growth and statically significant at 1% as in Model 2.

Table 2: Results of random effects test

Variables	Model 1		Model 2		Model 3		Model 4	
	Coefficient	z-stat	Coefficient	z-stat	Coefficient	z-stat	Coefficient	z-stat
Constant	0.043*	3.31	0.002	0.17	0.020	1.31	-0.001	-0.10
Defense	-0.149*	-3.73	-0.226*	-4.01	-0.161***	-3.50	-0.222*	-3.98
FDI	0.222*	6.07	0.229*	6.66	0.227*	6.30	0.230*	6.39
Population	-0.006	-0.15	-0.095***	-1.81	-0.076	-1.64	-0.111**	-1.92
Corruption	0.001	0.29	0.001	0.66	-0.0003	-0.08	0.001	0.29
Dummy	-0.027***	-1.73	-0.026*	-1.70	-0.027***	-1.75	-0.026***	-1.71
Internal	-	-	0.005*	5.28	-	-	0.004**	3.38
External	-	-	-	-	0.003*	2.56	0.001	0.61
R ²	0.11		0.14		0.12		0.15	
Within	0.12		0.17		0.43		0.17	
Between	0.27		0.39		0.12		0.43	
Wald test	82.47 (0.0)		191.55 (0.0)		196.99 (0.0)		206.01 (0.0)	
Hausman	8.76 (0.11)		7.81 (0.25)		6.83 (0.33)		8.01 (0.33)	
N	180		180		180		180	

****Indicates coefficient is significant at 1%, 5% and 10% levels of significance, respectively and numbers in parentheses are probability values. FDI: Foreign direct investment

Its z-value is -3.98. Moreover, FDI, internal conflict and dummy variable are statically significant at 1% 5%, and 10% level respectively. Corruption is not statically significant in all models. In Model 4, R² is 0.15, Wald statistic is 30.36 and significant at all levels.

5. DISCUSSION AND CONCLUSION

The Middle East has been a tumultuous geography throughout the history. Struggle for utilization of rich underground resources, Arab-Israeli conflict and sectarian differences have been major sources of conflict in the Middle East as well as the threat posed by terrorist groups of different orientations. This situation increased the relative necessity and importance of defense spending in the face of other public spending sub-categories such as education and health which may have more favorable effects on growth and development of the Middle East countries.

Defense spending for protection against internal and external conflicts and for national interests has an influence on economic growth performances of countries. Empirical studies on the literature have been generating conflicting results so far. The relationship between defense spending and economic growth was investigated for a panel of 12 Middle Eastern countries. Panel data approach was employed to data for the 1998-2012 period. According to the results of the tests, economic growth in the studied panel of countries is negatively affected by defense spending. As expected, FDI has a positive effect on economic growth in these countries. Expected results were also obtained when we control for the effects of global financial crisis of 2009; global economic crisis has a negative impact on the economic growth of studied Middle Eastern countries.

Checking for the effects of internal and external conflicts, our empirical findings point that negative effect of defense spending on economic growth aggravates during internal and external conflicts. 1% increase in defense spending in case of conflicts decreases the rate of growth by approximately 0.22%, with the effect on growth is a little bit lower during external conflicts than that of during internal conflicts. This may be resulting from the fact

that most of the countries in our panel (except Israel, and to some extent Iran and Turkey) are importers of defense goods. Most of the countries in our sample have primitive or developing defense sectors. Positive growth effects of investments to defense industry in developed countries generally occur through externalities in research and development, infrastructure and human capital. In the Middle East, in general, increased demand for such goods during times of conflict consumes resources from other sub-categories of public spending, which are transferred to abroad to finance defense spending.

According to the findings of the study, three separate policy recommendations can be made. First, public resources can be allocated to physical infrastructure in transportation, health, education, etc. and social areas such as arts and culture to decrease the possibility of internal conflicts. Such investments in problematic regions may serve to curb conflicts. Second, resources can be directed to measures for encouraging an export-oriented policy, improving bilateral trade ties with the rest of the world. Increase of trade with neighbors would particularly decrease possibility of external conflicts. Third, development of a domestic defense industry may be selected as a policy option and resources may be channeled to that direction, as done by Iran, Israel and Turkey.

The finding that the effect of FDI remains positive during conflicts, though, should be approached with caution. Generally, investors refrain from making investments during crises due to uncertainty. Geographical concentration of foreign investments in regions which are not affected by conflicts or deemed more secure by investors (such as the western part of Turkey) may be a cause of this result. Moreover, exclusion of lags from the study may prevent the observation of lagged negative effects of conflicts. In this respect, the nature of the relationship between FDI and economic growth under conflict conditions calls for further research with a more focused approach.

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