

The Relationship Between Military Expenditure and Economic Growth in Some Middle Eastern Countries: What Is the Story?

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Abstract

How the military burden affects economic growth, especially in developing countries, is the subject of much research in the economic literature. Studies have varied on the findings of the effects of military expenditure (ME) on growth. Therefore, we see multiple schools of thought about the relationship between ME and economic growth. However, there is a consensus that ME does in general come at an economic cost.

In this paper, we use annual time series data on ME, economic growth, net export (NX), and central government expenditure (GE) in Israel and its four Arab neighbors for the period 1988-2010 to investigate the relationship between ME and the other variables for each country individually. The paper uses the unit root and cointegration techniques to determine the relationship between ME and GDP. To investigate the direction of causality between ME and GDP, we use Granger-Causality method.

The main conclusion is that “relative” peace time doesn’t mean countries will stop or reduce ME. The rate of ME growth might not be as fast as it is during war times, but it is affected positively by the local income and the economic situation of the country.

Keywords: military expenditure, economic growth, Middle East, relative peace

1. Introduction

A central question that occupied the minds of economists, political scientists, and policy makers, who are interested in studying economic growth and militarization in developing countries, is whether the Military Expenditure (ME) is a burden on the national economy and to what degree is the size of this burden in times of peace and war? What are the mechanisms that this ME affects the macroeconomic indicators like saving, investment, external debt, private and public consumptions, and most importantly the growth in GDP?

The direct comparison between ME and economic growth appears to be of non-sense since each one of them requires the other to exist, but the question about the size of the burden is still so important since it tries to find answers about methods of financing and direct and indirect effects. All comes to the most important question: What is the ideal level of ME, or how much is enough to achieve the security level required to achieve the continuity of the development process?

The importance of the question comes from the fact that the military sector uses large size of the limited resources of any society. Those scarce resources have alternative uses in the productive sectors of the economy. Transferring any productive resource(s) from civilian to military sectors will lead not only to a decrease in the level of civilian sector production, but also means less resources available to be used by the military sector in the future. This idea does not suggest necessarily that a cut in ME will lead to a better standard of living in the society, since it depends on the ways of allocating resources. Depending on the framing of the research, studies have varied on the findings of the effects of military expenditure on growth (Dunne & Tian, 2015).

Until recently, there has not been a scholarly consensus on the effects of ME on economic growth. One consensus, after a vast amount of research, is that military expenditure does in general come at an economic cost. The lesson might be that if one wants to have any hope of becoming (militarily) strong, one should invest in

one's economy (Dunne & Tian, 2015). It is important to point that this study does not intend to conclude if the ME is "good or "bad" rather than trying to measure the economic effects of this expenditure on the performance of the national economy.

The rest of this paper is organized as follows: Section 2 provides theoretical and literature review for the relationship between ME and economic growth. Section 3 gives discussion for the methodology used and gives a brief look at data Sources. Section 4 gives discussion for the methodology used and the empirical results. Finally, Section 5 concludes the study.

2. The Relationship between ME and Economic Growth

There are a few schools of thought about the relationship between ME and economic growth:

The first school is Beonit School. This school came to counter the classical economic thoughts. Benoit (1973 and 1978) came to the conclusion that there is a trade-off between growth and ME in developed countries but there is no evidence of such a relationship in developing countries (Benoit, 1973).

Benoit and his followers argue that there is a positive causality of ME on economic growth through few channels. First, the ability of the military establishment of using idle capital and human resources not used effectively in other economic sectors, second, the military establishment helps create and develop skills used by the labor force and develop management and organizational experiences that are needed for growth. Also, it helps to reduce the production cost and increase the production function through spending on research and development. Third, the effect of ME can be seen in what is called "Modernization" factor through the military establishment attempts to make structural change to the traditional economic and social relations in the society. In some cases, this took a violent nature (Deger & Sen, 1983). Fourth, the ME has some investment aspects through building roads, airports, seaports, and factories intended for military use, but have civilian use. They all fall in the category of accumulative capital formation. Therefore, the increase of ME may lead to an increase in total investment in the economy. However, this result is confirmed with some other worked done by Cohen & Ward (1996) and Yildirim, Sezgin, & Ocal (2005).

The second school argues that ME diverts resources away from more productive government uses like health and education (Lim, 1983). This school is in accordance with the classical economic school which views the military as a non-productive sector. Also, the security services that this sector provides to the society cannot be measured accurately to determine the efficiency level of the usage of resources. This is particularly important through the periods of peace between the state and its neighbors. Whether the ME is financed through taxation or borrowing, it will have economic and social costs. Many papers found such a negative relation like, Moran (1979), Linden (1992), Abu-Qarn (2010) and Bandirma (2015).

There are five main negative effects of ME on the economists of Less Developed Countries (LDC):

First, the government production suffers from heavy bureaucracy and low production rates. Second, if exports are the catalysts for growth, then ME will lead to dangerous misallocation of resources from the most productive sectors in the economy. Third, usually if ME is financed through borrowing, then it leads to larger external debt. Fourth, the use of research and development in the defense industry may harm the technological and productive base in the civilian sector. And finally, the crowding-out effect of ME through the use of more investment which creates inflation pressure that removes private investment out of the market (Chan, 1985).

The third school of the relationship between ME and economic growth argues that the causality is bi-directional. Proponents of this school point that higher defense spending causes economic growth, and economic growth leads to higher ME (Cappelen, Gleditsch, & Bjerkholt, 1985) and (Kusi, 1994). This result is also confirmed by Chowdhury (1991) and Looney (1992).

The fourth and last school about the matter, states there is no relationship between ME and economic growth (Biswas & Ram, 1986).

As much literature investigating the relationship between ME and economic growth, both empirically and theoretically, as little consensus on that kind of effect could be. The growth literature and defense economics literature come to contradictory conclusion. While the mainstream growth research does not find ME as significant in determining growth (Sala-i-Martin, Doppelhofer, & Miller, 2004), research in the defense economics field finds military expenditure to be a significant determinant of growth (Smith, 2000).

The fundamental conclusion is that the military spending-growth relationship is complex, and cannot be explained by the existing models (Deger, 1986), or even more advanced models (Dunne, Smith, & Willenbockel, 2005). We need to look in more depth about the nature of the growth process, the demand and supply effects, and

the nonlinearities of the effects of ME on growth in order to understand the process appropriately (Deger, 1986).

3. Methodology Data Sources

Different methods used to investigate the ME growth relationship. Cross sectional data analysis was used in some studies like Benoit (1978). Other researchers followed this path and found conflicting results (Ram, 1995). Among other criticisms of the cross-sectioned data model that it leads to the difficulty of interpreting the estimates since it "assumes" identical parameters for different countries (Ram, 1995). It also contains the danger of assumption of homogeneity of countries in the sample (Sandler & Hartley, 1995) which is clearly not the case in our sample. That makes the choice of cross-sectioned data not appropriate here.

On the other side, the use of panel-data allows the researcher to investigate different kinds of cross-country variations, allows for higher degrees of freedom, but it has some limitations. First, it has the potential to have a significant cyclical or random component. Second, it reduces the amount of information about individual countries and might bring us back to time series data (Ram, 1995). Based on the above discussion, we decided to use annual time series data to analyze the ME-growth relationship for each country individually.

The data used in this paper are annual time-series for the period 1988-2010. This period represents the "Relative Peace" period for a few reasons. First, the end of the civil war in Lebanon in 1989 brought the central government in that country to be in control of the military affairs and as a result, Lebanon ME was recorded. Second, the Madrid Conference was held in 1991 to restart the peace process in the region.

Third, the Oslo negotiation started between Israel and the Palestine Liberation Organization (PLO) and the two rivals signed the peace declaration in 1993. Fourth, the Jordanian-Israeli Peace Treaty was signed in 1994 and ended the conflict between the two counties. Fifth, Syria and Israel had face-to-face negotiations for the first time. Even the negotiation did not end with a peace treaty; it reduced the tension between the two countries to a large degree. Last but not least, Israel withdrew from Southern Lebanon in this period was a major step to reduce the tension between Israel and its northern neighbor. Studying the ME growth relationship in this period, we believe, is a crucial issue to see if the established hypotheses still hold in a time of relative peace.

Data on GDP, net export, and central government expenditure were obtained from the UN statistical database and data on the ME comes from the Stockholm International Peace Research Institute (SIPRI) database on military expenditure. SIPRI database considered the best source for such data since it is the only source among others that provides ME for all the counties in the study for the entire period.

However, even where military expenditure data is published by national governments, these data may be subject to a number of problems that may limit international comparability and a proper understanding of the economic burden of the military on the country. One problem is that different countries define ME differently. SIPRI always seeks data as close as possible to its definition, but this is not always available.

In addition, there are some potential hurdles relating to the reliability, transparency, and comprehensiveness of the ME data. Data sources may or may not be accurately reporting ME, and there is a question of what the source countries are actually measuring. In some countries, especially lower-income countries with limited state capacity, the systems for financial monitoring and control in the military sector and elsewhere may be weak. Actual levels of expenditure may be incompletely recorded or actively falsified, due to corruption.

All the issues discussed here highlight the problems with the data used in our analysis and show that these data are not the authors' ideal measure of ME. However, it is the best data accessible to the authors for the purpose of the analysis.

4. The Model, Results and Discussion

We start with a look at the correlation coefficients among the four variables for each country. Table 1 shows the results. It appears that ME varies in its correlation with the other three variables from high positive correlation with GDP in the case of Syria to highly negative with Net Export (NX) in the case of Jordan. Except for Egypt, ME and GDP have a high correlation coefficient which indicates that there might be more to their relationship. As mentioned above, if both the ME and GDP have high correlation in the period of study, then it is very reasonable to expect that at least one of them to have some effect on the other.

The reason we see to include Net Export is that the counties covered by the study are non-oil producers. Therefore, they try to diversify their revenues through export oriented policies and encourage foreign investments. At the same time, the counties became more and more dependent on imported goods and services as there population increases and the demand for new products increases. That means to measure openness to trade for these countries; it is not enough to look at either imports or exports, but rather on Net Export.

The use of Granger-Causality in this study comes mainly from our interest in the direction of causality between the ME and GDP. We are not looking to see if they have a significant relationship, but to see the direction of the impact, if it exists, from one of them to the other. Despite the criticisms this approach received, it is still popular and can bring the intended results if data is tested and corrected for unit roots and cointegration (Abu-Qarn, 2010) and (Dunne et al., 2005). More than that, the test is still popular in the field and we intend to use it.

Second step is to test the variables for stationarity. We used augmented Dickey–Fuller test (ADF) test. The results are reported in Table 2. The four variables in all the countries are non-stationary at their levels and they are stationary at first difference. After taking the required difference in the time series to establish stationarity, we checked for cointegration to see if the variables have a long-run relationship with each other. We used Johansen test for that purpose and the results are reported in Table 3. The null hypothesis of no cointegration was rejected for all the countries except Syria. This indicates that except for Syria, there is a long-run relationship between the four variables in the sample. That means we do not expect to see a causal relationship between the variables in the case of Syria.

Based on the Johansen test result, the need for an error correction term is crucial to capture the long-run relationship.

To see if there is a Granger Causality between ME and economic growth, we used the following error-correction model for each country where all the variables are expressed in the appropriate differences to guarantee stationarity.

$$G_t = \alpha_o + \sum_{i=1}^{n1} \alpha_{1i} G_{t-1} + \sum_{i=1}^{n2} \alpha_{2i} M_{t-i} + \sum_{i=1}^{n3} \alpha_{3i} GE_{t-i} + \sum_{i=1}^{n4} \alpha_{4i} X_{t-i} + \lambda EC_{t-i} + e_i$$

where: G is economic growth; M is military expenditure (ME); GE is government spending; X is net export (NX); and EC is the error-correction term obtained from the multivariate cointegration relationship; and n is the lag orders in the polynomials of α 's.

To test the other possible direction of the causality, that economic growth Granger Causes ME, we use a similar equation with ME as the dependent variable:

$$M_t = \beta_o + \sum_{i=1}^{m1} \beta_{1i} M_{t-1} + \sum_{i=1}^{m2} \beta_{2i} G_{t-i} + \sum_{i=1}^{m3} \beta_{3i} GE_{t-i} + \sum_{i=1}^{m4} \beta_{4i} X_{t-i} + \varphi EC_{t-i} + \mu_i$$

Our focus is to see if the coefficients α_{2i} and β_{2i} which represent the short-run Granger Causality and λ and φ which represent the long-run causality are statistically significant. The preliminary empirical results of the above two equations are reported in Table 4. It seems that the results are mixed. For Egypt, ME appears to not Granger Causes economic growth while the opposite relation appears to be there, means economic growth causes higher ME. For Israel, we see the same results as for Egypt. For Jordan, we can see a bi-directional impact. That means ME and growth Granger Causes each other. The same result can be seen in Lebanon. And for Syria, as expected from the integration test, ME and growth do not Granger Cause each other which means they have no relation.

Regarding the causality between ME and NX, the paper found a solid direction from ME to NX for the four countries except Lebanon, however, the opposite direction was proven this time only to Lebanon. This result may contradict the first causality which was complete causality direction from economic growth to ME finding since NX is a main part of GDP and economic growth, and thereby should have similar effect and directional of causality like economic growth. However, this can be attributed somewhat to the importance of economic growth as a whole not just any part of it (NX).

Regarding the causality between ME and GE, it was clear for the four countries (except Jordan) that if governments increase/decrease their spending, similar effect will happen to ME since the latter is a main part of government expenditure. Regarding Syria, none of the above causality relationships were found significant. These no causality results are consistent with the results of finding no cointegration relationship among the variables for the Syrian case.

As we mentioned earlier, the cointegration test result indicated no relationship among the variables in the case of Syria and that is confirmed by the Granger Causality Test. No variable is Granger Causing any other variable in the case of Syria.

5. Conclusion

In this research paper, we tried to trace the behavior of military expenditures in times of (relative peace) for countries surround Israel (Jordan, Egypt, Lebanon, and Syria) in addition to the former. The relationships of ME with main economic indicators were tested for countries for the annual time period (1988-2010). The methodology of this study involves using a number of econometric techniques; in particular, Unit Root test, Cointegration analysis, and Granger Causality test.

Analyzing the relationship of 3 main economic variables; GDP, NX and GE, with the ME, found that these 4 variables have cointegration relationships for all 5 countries except Syria. This means that for this country significant meaning statistical relationships and causality directions cannot be found. With the regard to the other countries, even though there were cointegration relationships among the variables of interest, the results for causality appear to be mixed.

The results of the econometric techniques show that there is a consensus in the direction from economic growth to ME. That was true for all four countries. However, the opposite direction, i.e. from ME to economics, was proven only for Jordan and Lebanon. That is, for these two countries, ME experiences a promoting factor that helps enhancing economic growth.

In this paper, we achieve a main conclusion that “relative” peace time doesn’t mean countries will stop or reduce ME. At the same time, ME might not grow at fast rates as war times, but for sure it is affected positively by the local income and the economic situation of the country.

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Appendix

Table 1. Correlation coefficients

Country	Correlation Coefficient of ME with:		
	GDP	NX	GE
Egypt	0.336	0.288	0.327
Israel	0.691	0.411	0.753
Jordan	0.832	-0.812	0.929
Lebanon	0.721	0.490	-0.322
Syria	0.853	0.491	0.831

Table 2. Stationarity test results for variable at level (5% critical value)

Country	Variable	Statistic	Lag	Trend	Variable	Statistic	Lag	Trend
		Level				1 st difference		
Jordan	GDP	-0.098	2	Yes	DGDP	-3.347*	2	No
	NX	-0.669	1	No	DNX	-4.969*	0	No
	GE	0.805	4	No	DGE	-2.887*	2	No
	ME	0.024	1	No	DME	-4.559*	0	Yes

Egypt	GDP	0.007	2	Yes	DGDP	-2.787*	2	No
	NX	-0.026	1	No	DNX	-3.355*	0	No
	GE	-0.218	3	Yes	DGE	-2.827*	2	No
	ME	-1.584	2	No	DME	-2.625*	1	No
Syria	GDP	-1.275	1	Yes	DGDP	-5.823*	0	No
	NX	-1.898	1	No	DNX	-5.528*	0	No
	GE	0.942	2	No	DGE	-4.356*	1	Yes
	ME	-1.162	1	No	DME	-5.833*	0	No
Lebanon	GDP	-0.421	1	No	DGDP	-3.968*	1	No
	NX	-2.034	1	No	DNX	-7.096*	0	No
	GE	-1.047	4	No	DGE	-5.778*	0	No
	ME	-1.480	1	No	DME	-7.038*	0	No
Israel	GDP	-2.251	1	Yes	DGDP	-4.186*	0	No
	NX	-0.087	1	No	DNX	-5.245*	0	No
	GE	-3.449*	1	Yes	DGE	-3.466*	2	No
	ME	-1.487	2	No	DME	-6.923*	0	No

Note. (L) stands for optimal lag. It is determined using LAG using AIC

(*): means significant at 5% level or better.

Table 3. Johanson Cointegration test results

Country	Null Hypothesis	Test Statistic
Egypt	$r = 0$	91.808***
	$r \leq 1$	39.392***
	$r \leq 2$	14.394
	$r \leq 3$	4.662**
Israel	$r = 0$	81.156***
	$r \leq 1$	30.213**
	$r \leq 2$	11.333
	$r \leq 3$	3.918**
Jordan	$r = 0$	88.366***
	$r \leq 1$	41.325***
	$r \leq 2$	13.292
	$r \leq 3$	4.018**
Syria	$r = 0$	40.821
	$r \leq 1$	21.493
	$r \leq 2$	9.182
	$r \leq 3$	2.215
Lebanon	$r = 0$	73.572***
	$r \leq 1$	30.780**
	$r \leq 2$	11.590
	$r \leq 3$	1.193

Note. *** Significant at 1%, ** Significant at 5%

Table 4. Granger causality test directions

Jordan			Egypt		
NX	↔	GDP	NX	-	GDP
GE	↔	GDP	GE	←	GDP
ME	↔	GDP	ME	←	GDP
GE	→	NX	GE	←	NX
ME	↔	NX	ME	→	NX
ME	←	GE	ME	←	GE

Lebanon			Syria		
NX	→	GDP	NX	-	GDP
GE	-	GDP	GE	-	GDP
ME	↔	GDP	ME	←	GDP
GE	←	NX	GE	-	NX
ME	←	NX	ME	←	NX
ME	→	GE	ME	-	GE

Israel		
NX	←	GDP
GE	←	GDP
ME	←	GDP
GE	→	NX
ME	→	NX
ME	↔	GE

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