NAVAL POSTGRADUATE SCHOOL

MONTEREY, CALIFORNIA

MBA PROFESSIONAL REPORT

Defense Expenditure and Economic Growth: Empirical Study on Case of Turkey

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By: **Ertugrul Tekeoglu**
                 June 2008

Advisors: **Robert E. Looney**
                   Raymond Franck

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REPORT DOCUMENTATION PAGE		*Form Approved OMB No. 0704-0188*

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instruction, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188) Washington DC 20503.

1. AGENCY USE ONLY *(Leave blank)*	2. REPORT DATE June 2008	3. REPORT TYPE AND DATES COVERED MBA Professional Report
4. TITLE AND SUBTITLE Defense Expenditure and Economic Growth: Empirical Study on Case of Turkey		**5. FUNDING NUMBERS**
6. AUTHOR Ertugrul Tekeoglu		

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
    Naval Postgraduate School
    Monterey, CA 93943-5000
		8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING /MONITORING AGENCY NAME(S) AND ADDRESS(ES) N/A		**10. SPONSORING/MONITORING AGENCY REPORT NUMBER**

11. SUPPLEMENTARY NOTES The views expressed in this thesis are those of the author and do not reflect the official policy or position of the Department of Defense or the U.S. Government.

12a. DISTRIBUTION / AVAILABILITY STATEMENT Approved for public release; distribution is unlimited	12b. DISTRIBUTION CODE

13. ABSTRACT

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   Taking into account the difficulties present in previous military expenditure studies, an econometric model was specified and empirically tested using Turkish data for 1969-2004. Results suggested that there is a negative linkage between military expenditure and economic growth. The second part of the empirical study tested the defense-welfare relationship for Turkey using expenditures on health and education as welfare proxies. The empirical findings suggested that there are tradeoffs between military expenditures and welfare spending. However, there seems to be a positive relationship between military expenditures and education.

   The Turkish Republic's defense policy has been continually guided by Ataturk's proverb of "peace at home, peace in the world." However, sustaining a peaceful environment has required a high level of military expenditures. What makes Turkey's military expenditures relatively high? Is it possible to draw inferences that high military expenditures are a requirement for Turkey? To answer these questions, factors that are major reasons for high military expenditures are also discussed in this thesis. These include strategic factors, conflicts with PKK terrorism, disputes with Greece, the military modernization program, and the economic environment of Turkey.

14. SUBJECT TERMS Defense-growth relationship, defense spending, Turkish defense expenditures, defense tradeoff			**15. NUMBER OF PAGES** 111
			16. PRICE CODE
17. SECURITY CLASSIFICATION OF REPORT Unclassified	**18. SECURITY CLASSIFICATION OF THIS PAGE** Unclassified	**19. SECURITY CLASSIFICATION OF ABSTRACT** Unclassified	**20. LIMITATION OF ABSTRACT** UU

NSN 7540-01-280-5500

Standard Form 298 (Rev. 2-89)
Prescribed by ANSI Std. 239-18

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DEFENSE EXPENDITURE AND ECONOMIC GROWTH: EMPIRICAL STUDY ON CASE OF TURKEY

Ertugrul Tekeoglu
First Lieutenant, Turkish Air Force
B.S., Turkish Air Force Academy, 2002

Submitted in partial fulfillment of the
requirements for the degree of

MASTER OF BUSINESS ADMINISTRATION

from the

**NAVAL POSTGRADUATE SCHOOL
June 2008**

Author: _____
                 Ertugrul Tekeoglu

Approved by: _____
                 Robert E. Looney, Lead Advisor

                 _____
                 Raymond Franck, Support Advisor

                 _____
                 Robert N. Beck, Dean
                 Graduate School of Business and Public Policy

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ACKNOWLEDGMENTS

I wish to express my sincere appreciation to my advisors, Professors R. Looney and R. Franck, for their guidance and contributions, and most importantly their patience and understanding during the thesis process. I am grateful to have had the opportunity to work with such outstanding professors, without whose help this thesis would never been written.

I would also like to thank the Turkish Air Force for affording me the opportunity to attend the Naval Postgraduate School.

I owe a great debt to my wife, Isil Tekeoglu, for her patience and support during the course of my graduate studies, at a great personal sacrifice of her career.

Last, but not least, I would like to thank all the people who have helped me in some way reach this point.

I dedicate this work to them, whose loved ones gave their lives in defense of Turkey to contribute to peace and security.

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I.   INTRODUCTION

The main purpose of this thesis is to find the relationship, if any, between defense spending and economic growth for Turkey, and to discuss the policy implications of the empirical results. In the sense of being one of the largest defense spenders within both the countries that make up the Middle East and NATO, this question is very crucial for Turkey's future economic and political situation. The following chapters, which are thought to sum up the overall picture, are included in the thesis to manage the main purpose.

Defense economics has emerged as a relatively new field of study within the sub-disciplines of economics. Interest in defense economics began during World War II and has continued to the present day. Chapter II introduces the definition and study areas of defense economics, as well as the relationship between defense economics and trends in world defense expenditures. It also reveals the events that have made defense economics more favorable.

Confirming a relationship between defense spending and economic growth has been an important area of study for defense economists, including the important contribution of Benoit (1973, 1978), who stated that expenditures may lead to growth by various factors. After Benoit's striking results, the relationship between defense expenditures and economic growth attracted considerable attention among many defense economists, and a number of empirical studies to reveal a relationship, if any, between these variables have been undertaken. Chapter III presents an extensive literature review on the defense-growth relationship.

Defense spending has been one of the major components of government expenditures both for developed and developing countries. Defense burden (defense spending as a share of GDP) varies by country depending on the economic, social, and political dimensions of both domestic and international environments. A detailed examination of the connection between defense spending and economic growth shows

1

that there may be some cases where making an overall generalization of a defense-growth relationship is not reliable. Chapter IV highlights different associations between defense spending and output under the light of previously published studies.

Unfortunately, there are conceptual, methodological, and practical difficulties in the collecting and processing of statistical data on military expenditures. Fortunately, there are primary sources of information on military expenditures; however, they also create some of the above problems. It is important to be able to measure military expenditures correctly, if possible, because the results of studies pertaining to defense economics may affect the regional force balance. If military expenditures can not be measured correctly, knowing the deficiencies and constraints of studies becomes crucial before making any policy. Therefore, Chapter V is included to present the difficulties of military expenditure studies.

The main purpose of finding the relationship, if any, between defense spending and economic growth for Turkey is pursued in Chapter VI. Econometric models are specified and empirically tested to reveal growth and welfare tradeoffs of military expenditures. The association between investment, barrowing, military expenditures, and economic growth is investigated in the first part of the empirical study. The direction and level of welfare tradeoffs between military expenditures and health and education for Turkey is investigated in the second part.

What makes Turkey's military expenditures relatively high? Is it possible to draw inferences that high military expenditures are a requirement for Turkey? To answer these questions, factors that are predicted to be major reasons for the high military expenditures of Turkey are discussed in Chapter VII. Finally, Chapter VIII discusses the conclusions of the thesis research and study, proposes recommendations, and draws some policy implications.

II.   DEFENSE ECONOMICS AND EXPENDITURES

Within economics, a number of specialized fields as sub-disciplines of economics have been established such as labor economics, public finance, monetary, environmental, industrial organization, institutional, and development. Defense economics is a relatively new field of study within the sub-disciplines of economics. Interest in defense economics began during World War II and has continued to the present day (Hartley & Sandler, 2001).

That achieving macroeconomic goals makes all of society better off is a common opinion among economists, who agree about the importance of the following three main economic goals: economic growth, high employment, and stable prices (Lieberman & Hall, 2005, pp. 349-360). One of the major roles of government in the economy is to provide *public goods*. If a good is *nonexcludable* and *nonrival,* it is called as *pure public good* (Lieberman and Hall, 2005, pp. 339-342). National defense is one of the pure public goods. It is a nonexclusive good because it provides benefits for all citizens and no one can be excluded from enjoying it. It is also a nonrival good in that additional consumers may use it at zero marginal costs (Nicholson, 1997, pp. 510-514).

A.   DEFINITION OF DEFENSE ECONOMICS

Intriligator (1990) addresses the need of identity and legitimacy for the fields of defense economics. Therefore, he defines defense economics within its nature and scope as follows (as cited in Hartley & Sandler, 2001, p. XV);

> …that part of the overall economy involving defense-related issues, including the level of defense spending, both in total and as a fraction of the overall economy; the impacts of defense expenditure, both domestically for output and employment and internationally for impacts on other nations; the reasons for the existence and size of the defense sector; the relation of defense spending to technical change; and the implications of defense spending and the defense sector for international stability or instability

Hartley and Sandler (2001) acknowledge that a broader definition of defense economics is also expressed by others. However, making the field's scope so broad may cause it to lose its identity. They argue that if the broader definition covers conflict resolution and international relations, that definition may be inside the scope of peace economics. Despite these concerns, Herrera (1994) informs that "the subject area of defense economics can be defined broadly to embrace all aspects of the economics of defense, disarmament and peace." The broader definition includes peace and war economics, arm races, alliances, disarmament, and so on (see Appendix A).

B. RELATIONSHIP BETWEEN DEFENSE ECONOMICS AND THE TREND IN WORLD DEFENSE SPENDING

Interest in defense economics began during World War II and has continued to the present day. Hartley and Sandler (2001) confirms that "contribution to the field have accelerated in the last two decades after the end of the Cold War which has added the peace keeping and peace enforcement as new topics to the study area of defense economics."

The world's military burden ratio, namely military expenditures to GNP, fell sharply from 4.7% in 1989 to 2.4% in 1999. The world's average military expenditures per capita ratio, a general measure of security costs, fell 43% from $254 in 1989 to $142 in 1999 ("U.S. Department of State, WMEAT 1999-2000," 2003). Even with dramatic cutbacks in "superpower military expenditures" (Zarko, 1993) after the end of the Cold War, security arrangements have been reestablished all around the world. One of the most important questions that had been thrown out for consideration from the end of the Cold War was how a reduction in defense spending would affect economic performance. This question had been very important for further policy implications for countries facing public demand for defense cutbacks.

FIGURE 1 World Military Spending

Copied from : SIPRI Yearbook 2007, World Military Spending, Table 8A.1
Note: Some countries are excluded because of lack of data or or consistent time series data. World totals exclude Angola, Benin, Cuba, Equatorial Guinea, Guyana, Haiti, Iraq, Myanmar (Burma), North Korea, Qatar, Somalia, Trinidad and Tobago and Viet Nam.

Figure 1.   World Military Spending

Turkey needed a new regional military strategy to ensure security when the collapse of the Soviet Union caused instability and uncertainty in the Caucasus, Middle East and Balkans. Contrary to the general expectation of decreases in defense budgets, the collapse has caused an increase in military spending in the region to cope with new threats and risks. This argument can be seen in Table 1 While the defense burden of the superpowers; such as U.S. and Russia, decreased after the Cold War until year 2001, the defense burden for the Middle East and Balkan countries (Israel, Iran, Syria, Turkey and Greece) remained high during this period. The Middle Eastern countries spent an estimated 6.3% of GDP on the military compared with a global average of 2.3% (SIPRI, 2003).

Post-Cold War security requirements have changed after the 9/11 attack on the World Trade Center. The Cold War military structure was built to fight big wars against the nation states. The 9/11 attack revealed new requirements to fight against stateless terror. "New concerns have included failed states, communal violence, humanitarian crises, and the increased traffic in drugs and light weapons" (Conetta, 2003). The new

shape of national defense has required military transformation. This has increased defense expenditures, especially for the countries that are in involved in the war on terror (Ateşoğlu, 2005).

TABLE 1 Military Expenditure as Percentage of Gross Domestic Product (GDP)

	Country	USA	China	Japan	France	Germany	Russia	Turkey	Greece	Syria	Iran	Israel	Bulgaria
	1988	5.8	..	4.1	3.6	2.9	[15.8]	2.9	5	[6.9]	3.4	13.2	..
	1989	5.6	2.8	4	3.5	2.8	[14.2]	3.1	4.5	[7]	3.1	12.3	[4]
	1990	5.3	2.7	3.9	3.4	2.8	[12.3]	3.5	4.5	[6]	2.9	12.3	[3.5]
	1991	4.7	2.5	4.1	3.4	2.2	..	3.8	4.2	[9.1]	2.5	14.8	[2.8]
	1992	4.9	2.7	3.8	3.3	2	[5.5]	3.9	4.4	[7.9]	2.2	10.8	[2.7]
	1993	4.5	2.1	3.5	3.3	1.9	[5.3]	3.9	4.3	[6.4]	2.3	10.6	[2.4]
	1994	4.1	1.9	3.3	3.3	1.7	[5.9]	4.1	4.3	[6.5]	3.1	9.7	[3.6]
	1995	3.8	1.8	3	3	1.6	[4.4]	3.9	4.2	[6.2]	2.4	8.6	[2.6]
Years	**1996**	3.5	1.8	2.9	2.9	1.6	[4.1]	4.1	4.4	[5.2]	2.6	8.6	2
	1997	3.4	1.7	2.7	2.9	1.5	[4.5]	4.1	4.5	[5]	2.9	8.5	2.1
	1998	3.2	1.9	2.6	2.7	1.5	[3.3]	4.4	4.7	[5.1]	3.2	8.4	2.3
	1999	3.1	2	2.5	2.7	1.5	[3.4]	5.4	4.8	4.8	4.1	8.3	2.5
	2000	3.1	2	2.4	2.5	1.5	[3.7]	5	4.7	5.5	5.4	8	2.5
	2001	3.1	2.2	2.4	2.5	1.5	[4.1]	5	4.4	5	5.7	8.1	2.7
	2002	3.4	2.3	2.5	2.5	1.5	[4.3]	4.4	4.2	4.7	3.8	9.2	2.7
	2003	3.8	2.3	2.7	2.6	1.4	[4.3]	3.8	4	5.6	4.4	8.5	2.6
	2004	4	2	2.7	2.6	1.4	[3.9]	3.1	[3.9]	6.4	4.5	8.3	2.4
	2005	4.1	2	2.7	2.5	1.4	[4.1]	2.8	[4.1]	5.1	5.8	9.7	2.4

. . = Data not available or not applicable
[ ] = SIPRI estimate
Source: SIPRI Yearbook 2007, Military expenditures. *Facts on International Relations and Security Trends*

Table 1.   Military Expenditure as a Percentage of Gross Domestic Product

SIPRI (Stockholm International Peace Research Institute) Yearbook 2007 Chapter 8 indicates the recent trends in military expenditures as follows (refer to Table 2):

> World military expenditure in 2006 is estimated at $1204 billion in current prices. This represents an increase of 3.5 per cent in real terms since 2005 and of 37 per cent over the 10-year period since 1997. Average spending per capita has increased from $173 in 2005 to $177 in 2006 at constant (2005) prices and exchange rates and to $184 at current prices. World military expenditure is extremely unevenly distributed. In 2006 the 15 countries with the highest spending accounted for 83 percent of the total.
>
> In 2006 China continued its steep increase in military expenditure, for the first time surpassing that of Japan and hence replacing Japan as the country in Asia with the highest level of military expenditure and as the fourth biggest spender in the world. Amid intense discussions on the right level of Japanese military spending, Japan decided, for the fifth consecutive year, to reduce its military spending in 2006 while at the same time focusing its military budget on missile defense.

TABLE 2 Top Five Military Spenders in 2006 in Market Exchange and PPP Terms

		Military expenditure in MER dollar terms				Military expenditure in PPP dollar terms*		
Rank	Country	Spending ($b.)	Spending per Capita ($)	World Share (%)		Rank	Country	Spending ($b.)
				Spending	Population			
1	USA	528.7	1756	46	5	1	USA	528.7
2	UK	59.2	990	5	1	2	China	[188.2]
3	France	53.1	875	5	1	3	India	114.3
4	China	[49.5]	[37]	[4]	20	4	Russia	[82.8]
5	Japan	43.7	341	4	2	5	UK	51.4
Sub Total Top 5		734.2		63	29			965.5
World Total		1158	177	100	100			

MER : Market Exchange Rate; PPP : Purchasing Power Parity; [ ] : Estimated figures

*The figures in PPP dolar terms are converted at PPP rates (for 2005), calculated by World Bank based on comparison of GNP

Sources : **Military Expenditure:** SIPRI Yearbook 2007 Appendix 8A

PPP Rates: World Bank World Development Report 2006: Equity and Development

Table 2.   Top Five Military Spenders in 2006 in Market Exchange and PPP Terms

The major military spender in the world is the United States with 46 percent of the world total, whereas the UK, France, Japan and China follow the U.S. but far behind with 4-5 percent each. Therefore, U.S. military spending shapes world military expenditures in a dominant fashion. Military operations in Afghanistan and Iraq are the main reasons for the recent increase in U.S. military expenditures, which are labeled under the 'global war on terrorism' after the 9/11 terrorist attack. The cost of the war on terrorism for the U.S. had reached $432 billion as of June 2006 (SIPRI Yearbook 2007). The most recent cost of the war in Iraq is $485 billion as of December 2007 ("The cost of the war," 2007). SIPRI Yearbook 2007 claims that this increase in U.S. military expenditures has been considered as one of the major factors that has caused deterioration in the U.S. economy since 2001.

Each country spares a great amount of its national budget for defense spending and various factors influence the defense burden for a country. The trend of military expenditures may change depending on the increase or decrease in conflicts and security concerns while the importance of defense economics is kept at a high level. The peace

dividend for the years of decrease opportunity cost concerns for the years of increase made defense economies more favorable. The recent trend in world military expenditures is a good reason to expect that its effects will continue for the foreseeable future.

Among the various areas of defense economics, the burdens and benefits of military expenditures and their effects on economic growth within possible tradeoffs will be the main focus areas in following chapters.

III. BACKGROUND AND LITERATURE REVIEW

Confirming a relationship between defense expenditures and economic growth has been an important area of study for defense economists, including the important contribution of Benoit (1973, 1978), who stated that expenditures may lead to growth by "providing education and medical care, decreasing unemployment rate, engaging in variety of public works, scientific and technical innovations." Therefore, if the military did not spend its money in these areas, resources would have to be provided by the civilian sector (Benoit, 1978). Since Benoit's striking results, the relationship between defense expenditures and economic growth has attracted considerable attention among many defense economists. As a result, a number of empirical studies have been undertaken to reveal a relationship, if any, between these variables. However, there is still controversy about whether defense expenditures cause a higher or lower growth rate.

There are large numbers of empirical literature studies that investigate the economic effects of military spending. Grouping the literature reviews is possible in various ways, such as: depending on correlation results between defense expenditures and economic growth, methods imposed, data and sample used, and significance of results (also see Poot, 2000).

Arguments are not restricted to the relationship between defense expenditures and economic growth. Another side of the argument addresses the nature of causality between these two variables. Which one is causally previous to the other? Does defense spending initiate economic exchange or, conversely, is it affected by changes in the economy?

A. LITERATURE REVIEW

1. General Framework of Literature Review

In the literature, there are three groups of economists and policy makers who advocate different approaches for the defense-growth relationship. One group supports the neo-classical approach that argues defense expenditures deter economic growth. In

other words, this group finds a negative correlation between defense expenditures and economic growth (Deger, 1986; Değer & Smith, 1983; Heo, 1999; Kwaben, 1989; Lim, 1983; Shieh et al., 2002). A second group argues that the net effect of defense expenditures on growth is positive. This group supports the Keynesian Theory, and their results show a positive correlation between defense expenditures and economic growth (Ateşoglu, 2004; Ateşoglu & Mueller, 1990; Benoit, 1978). A third group argues that the relationship between defense expenditures and economic growth varies, as it could be positive or negative. Thus, it is not appropriate to generalize about a relationship between these variables for all countries. According to this perspective, there is neither a "clear-cut prediction" nor a consistent, statistically significant result of the relationship (Biswas & Ram, 1986; Chowdhury, 1991; Heo, 1998; Karakul & Palaz, 2004; Looney, 1988b, 1988a; Looney & Frederiksen, 1986b).

Different methods have been imposed to understand the defense-growth relationship, such as: cross-section analysis (Benoit, 1973, 1978; Biswas & Ram, 1986; Değer, 1986; Değer & Smith 1983; Dune and Perlo-Freeman, 2003; Kwabena, 1989; Lim, 1983; Looney, 1988a; Rothschild, 1973;), time series regression analysis (Chowdhury, 1991; Looney, 1989; Looney & Frederiksen, 1986b), and some other methods (Dakurah et al., 2001; Dunne & Perlo-Freeman, 2003; Karagöl & Palaz, 2004). Some have argued that statistic analysis of a cross-sectional sample is not sufficient to show the diversity that exists in different countries because of the variation in each state's economic and political systems (Ball, 1983; Heo, 1998; Looney 1988b; Yildirim & Sezgin, 2002). Therefore, examining the defense-growth relationship for a single country (Ateşoglu, 2004, 2006; Heo, 1999; Karagöl & Palaz, 2004) or employing longitudinal design for each country has been preferred by different authors (Heo, 1998). Also, the relationship between the variables was investigated for both short-term and long-term by different authors (Değer, 1986; Frederiksen & Looney, 1994; Poot, 2000; Shieh et al., 2002).

Since it is not possible to generalize the relationship between defense expenditures and economic growth for all, some authors have tried to find common features for similar countries. They have grouped countries dependent upon their

commonalities, such as: non-conflict and conflict states (Looney, 1988b), dependence on geography (Dunne & Perro, 2003; Kwabena, 1989), regional sensitivity (Heo, 1996; Kollias, 1994,1995; Kollias & Makrydokis, 1997; Öcal, 2002), organization (Hassan et al., 2003), being high/low growth or developed/developing countries (Benoit, 1978; Biswas & Ram, 1986; Değer, 1986; Dakurah et al., 2001; Lim, 1983), countries that are experiencing foreign-exchange constraints, and countries which are well-endowed with resources (Looney & Frederiksen, 1986b).

Within the large numbers of literature studies, some researchers found a significantly positive effect (Benoit, 1973, 1978), while others found a significantly negative effect (Değer, 1986; Değer & Smith, 1983; Kwabena, 1989; Lim, 1983; Rothschild, 1973), and some others even found an inconclusive effect or no effect at all (Biswas & Ram, 1986; Heo, 1998).

Causality for multiple countries (Chowdhury, 1991; Dakurah et al., 2001) as well as for a single country (Heo, 1996, 1999; Joerding, 1986) was investigated in several cases to find out the direction of the relationship between defense expenditures and economic growth.

2.   Criticism of Emile Benoit's Study among Literati

The purpose of this section is to evaluate Benoit's thesis and critically analyze its conclusion. His study has become one of the indispensible references for defense economists since it was the first that mentioned the positive defense-growth correlation. Benoit's study has been criticized by others not only because of the theoretical underpinning of his study but also because of the methodological approach he used.

Benoit's main hypothesis was that defense burden is positively correlated to growth rates in low-developed countries (LDCs). To test this hypothesis, he studied the relationship between defense spending as a share of GNP and the growth rate of civilian GNP for 44 developing countries for the period from 1950-1965 and from 1960-1965. His results indicated the presence of significant positive correlation between these two variables for the time period of 1960-1965. Benoit (1973) concluded that higher defense spending was the cause rather than the effect of economic growth.

Benoit (1973) argued that finding the average defense burdens of 44 developing countries positively correlated with their growth rates over a comparable time period was crucial evidence for stating that the more these countries spent on defense, in relation to size of their economies, the faster they grew. Implications of his study show that expenditures may lead to growth by providing education and medical care, a decreasing unemployment rate, engaging in variety of public works, and scientific and technical innovations (also see Benoit, 1978; Karagöl & Palaz, 2004; Looney & Frederiksen, 1986b).

In his following study, Benoit (1978) used data for 44 developing countries between 1956 and 1969. He created a model by including growth rates, investment rates, foreign aid receipts, and certain other variables to estimate the correlation between these variables.[1] He found that countries with a heavy defense burden generally had the most rapid rate of growth and vice versa. Benoit wrote about his surprising results by stating that finding sufficient evidence to show a positive defense-growth relation was contrary to his expectations.

Benoit (1978) acknowledged that some may think that reducing military expenses increases investment. He responded to this idea with the argument that in LDCs only a small percentage of the decrease in military spending went to productive investment while a major part of the released resources reveled away on nonproductive consumption. Therefore, even LDCs manage to cut down military expenditures; this action does not cause any significant increase in economic growth. Heo (1998) claimed that the poor economic performance of LDCs could be shown as an unexpected cause of reduced defense spending.

According to Değer (1986), Benoit's work did not provide a well-specified analytical model. Deger claimed that Benoit's econometric works depended on a single equation specification and thus, could not adequately account for the complex reality that needed to be explained. Değer (1986) claimed that;

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[1]Benoit uses Spearman rank order correlation and regression analysis to find out the defense-growth relation in this study.

There are multiple conduits through which one variable affects another, and there are other intermediate variables that play a crucial role in the overall system. The interdependence of the model and multiple causations are absolutely crucial to see the overall picture of the defense-development relation.

Değer (1986) pointed out that when direct effects like investment and indirect effects such as R&D and domestic savings-income ratio are considered overall, the negative relationship between defense spending and economic growth would be seen.

Ball (1983) also wrote a critique about Benoit's study in which he stated that "there were many problems with the way in which Benoit defined the variables he used and the interpretations he placed on the conclusion." He also argued that, to understand the effects of the armament process on socioeconomic development, case studies of individual rather than multiple countries should be examined.

Lim (1983) reexamined the Benoit's claim with a bigger sample of 54 LDCs over a more recent period (1965-1973) and the results showed that defense spending was detrimental to economic growth. It is also worth noting that Lim's reexamination shows how the data's time period may also change the results of the empirical studies.

To conclude, even though several authors criticized Benoit's work because of the model he employed or the theory he used, he deserves profound respect for creating a "heuristic idea" (Değer, 1986) of the various ways in which a higher military burden can affect economic growth, either positively or negatively.

Benoit's study encouraged others to contribute a series of books, papers, and articles which tried to criticize, revise, replicate, reanalyze and modify his results. The ongoing controversy within literary circles about his findings also shows that there is no clear-cut result for the defense-growth relationship.

3.   Turkish Literature Review

The effects of defense expenditures on economic growth have been studied extensively in Turkey as well. Various methodologies were used to analyze the relationship between defense spending and economic growth. However, the findings of

each study also differed from one another. Economists could not find a consensus answer to the question of how and in what respects defense expenditures influence economic growth in Turkey. A small portion of previous studies and results on the Turkish case is presented to show how results may change depending on the time period and model applied.

Sezgin (1997) investigated Turkish defense spending and economic growth between 1949 and 1993 using a 'Feder-type model' with human capital and found that defense expenditures had a positive effect on economic growth. Özsoy (2000) also applied the same model for a different period and did not obtain a significant effect of defense spending on Turkish economic growth. Following that, Sezgin (2000) and Dunne et al. (2001) analyzed the existence of a relationship between defense spending and growth using a Granger causality test. In contrast to Sezgin (2000), Dunne et al.'s findings revealed that defense expenditures adversely affected economic growth. Sezgin (2001) estimated defense-growth relationships between the years 1956 and 1994 via a 'Değer Model' and found a positive impact of defense on economic growth, but no significant effect on savings and the balance of trade. Yildirim and Sezgin (2003) reported that defense spending enhanced economic growth by raising aggregate demand in Turkey. They analyzed the effects of military expenditures on employments. The empirical findings suggested that military expenditures impeded employment both in the short run as well as the long run. Karagöl and Palaz (2004) used a series of unit root, cointegration and causality tests to make certain the direction of the causality between the growth of GNP and defense expenditures in Turkey for the period between 1955 and 2000. They concluded that there was a long-run equilibrium relation between GNP and defense expenditures. According to their short-run causality test, they found unidirectional causality between variables, from defense expenditures to economic growth.

In addition to a defense-growth relationship, defense-welfare tradeoffs for Turkey have also been investigated. In one of those studies, Yildirim and Sezgin (2002) found that the tradeoff between defense and health is negative while it was positive between defense and education. Also, the tradeoff between defense and budget deficits for Turkey

was examined by Günlük-Şenesen (2003), and he concluded that his results did not confirm the presence of such a tradeoff. In a follow-up study, Günlük-Şenesen and Sezgin (2003) tried to explore the debt tradeoff of defense in Turkey for the period between 1980 and 2000. They concluded that Turkish arms imports did not have a contributing effect on external debt for the examined period. However, the results were not strongly significant.

The arms race between Turkey and Greece has been one of the major topics of defense economics literature regarding Turkey. Various aspects of the arms race have been studied in many articles by several Turkish and Greek defense economists by using several empirical modeling techniques. Little evidence has been found in favor of an arms race between the two countries, despite a considerable amount of research (see Brauer, 2002, and references herein).

Brauer (2002) found four major topics within defense economics literature regarding Greece and Turkey. He stated these four major topics in his study as follows:

(a) is there, or was there, an arm race between Turkey and Greece? (b) what determines the demand for military expenditure; (c) what is the impact, if any, of military expenditure on economic growth in Turkey and Greece; and (d) what is the nature, extend, and impact of indigenous arms production in these countries?

Some of the studies, which have estimated a military expenditure demand function, claimed that Turkish and Greek defense allocations are strongly influenced by each other's military spending (Kapopouos & Lazaretou, 1993; Kollias, 1994; 1995; Sezgin & Yildirim, 2002; Yildirim & Sezgin, 2003). Empirical results varied from one study to the next depending on the time period used and the methodology employed by the studies; such studies included those by Majeski (1985), Refenes et al. (1995), Georgiou et al. (1996), Kollias and Makrydakis (1997), Smith et al. (2000), Dunne et al. (2001), Öcal (2002), and Andreou (2000). However, there are several gaps and shortcomings related to the data and data sources, models, and theoretic views employed. Breuer (2002) also focused attention on the problem of the implementation of the findings as follows;

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…whether or not the statistical results are in line with or contrary to one's expectations, *post hoc* rationalization of one's findings is very easy. For instance, suppose one found that Greek military expenditure followed Turkey's. The rationalization is that Greece did not wish to fall behind Turkey. Now suppose the opposite case: Turkish military expenditures follow Greece's. Now the rationalization is that Turkey does not wish for Greece to catch up. Whatever the finding, each makes 'sense'.

4.   Related Surveys for Further Information

Many empirical studies have been published to understand the relationship between defense spending and economic growth for various countries for a range of time periods by using assorted methods as described in this chapter. A comprehensive review of writings on defense-growth literature can be found in following surveys.

Lindgred (1984) surveyed 40 reports that studied the consequences of military expenditures from various countries. His survey included methods and results of empirical studies that were carried out between 1968 and 1984. More recent studies can be found in Dunne (1996), who surveyed reports on 54 studies between 1973 and 1996 that dealt with the economic effects of military expenditures in LDCs (as cited in Pool, 2000). Moreover, Pool (2000) surveyed 93 published articles in several journals for the years between 1982 and 1998 to provide a synthesis of evidence regarding the relationship between government policies and growth. His article includes a chart showing the results and methods of 21 articles previously published on the defense-growth relationship.

B.   CONCLUSION

A large number of papers examine the relationship between growth and defense by using several econometric methods. Some of these econometric methods are based on the supply-side approach where production roles and "interrelationships" (Değer, 1986) are among the sectors included. An alternative demand-side approach is based on the Keynesian definition of aggregate demand where the output is the sum of the components. The next chapter of this thesis focuses on the relationship between defense spending and economic growth under these different approaches.

IV. OVERVIEW OF DEFENSE-GROWTH RELATIONSHIP

Defense spending has been one of the major components of government expenditures for both developed and developing countries. Defense burden (defense spending as a share of GDP) varies by country depending on the economic, social, and political dimensions of both domestic and international environments. For developed countries, an increase in defense spending raises aggregate demand which sustains higher national income and employment. Moreover, the affected industries may have economies of scale; thus a higher level of defense spending may mean lower production costs in addition to an increase in economic activity. Developed countries also take advantage of spinoff and spillover of military R&D and technology. However, for the LDCs or developing countries, the issue of whether higher defense spending either burdens or benefits the economy is more controversial. Therefore, while defense spending in industrialized countries has been a matter of disagreement, its effects on the development process of emerging economies has likewise been an issue that has seen some rather heated debates (Payne & Sahu, 1993).

Although it seems to be logical to suppose that defense spending encourages economic growth in industrialized countries and slows down economic progress in LDCs, a detailed examination of the linkages between defense spending and economic growth shows that there may be some cases for which this intuition is not a reliable guide. In other words, stating that defense spending decreases growth in LDCs and developing countries is not universally true.

The vast literatures on the economic effects of military expenditures suggest a number of different linkages between defense spending and output. They can be broadly grouped into supply-side effects, demand-side effects, and security effects.

A. DEFENSE-GROWTH RELATIONSHIP

1. The Supply-side Effects

The neo-classical production function approach employs a supply-side description of chances in aggregate output (Payne & Sahu, 1993, p.20). The supply-side approach focuses on the opportunity cost of scarce resources. In the latter case, defense spending diverts scarce resources away from more productive uses; this, in turn, causes a reduction in civilian consumption and lowers the well-being of the society because of the reduction in civilian and public savings and investments. Although these arguments often suggest an adverse effect of defense on growth, some positive linkages can also be involved as spillovers.

Hartley and Sandler (2001) summarize the supply-side model under the name of a Feder model as follows;

> In a seminal paper, Feder (1983) introduces a supply-side theory to explain economic growth that allows for an externality between sectors as well as inter-sectors productivity differences. Feder is interested in beneficial externalities stemming from the export sector, which arise from better management practices, embodied technology, improved techniques, and higher quality labor.

Feder's two sector analyses have received considerable attention within the literature. For example, Feder's two sectors of exports and non-exports are replaced with the private and public sector by Ram (1986) and with military and non-military sectors by Biswas and Ram (1986).

a.   Negative Effects

Neo-classical approaches generally lead to the conclusion that defense expenditures lessen economic growth. The "guns-butter tradeoff"2 relegates military spending to an inefficient use of resources (Shieh et al., 2002, p. 443). This assumption (inevitably) implies that using resources for military expenditures prevents using these resources for economic activities such as investment, public infrastructure, and social programs. Since "economics is the study of choice under conditions of scarcity" (Lieberman & Hall, 2005, p. 1), allocation of the resources for reaching economic goals could be managed with fewer resources. This group claims that the opportunity cost of spending on defense is significant, and that pursuing other economic activities would make the society better off. Therefore, although defense spending increases security, it requires sacrifices of resources which could increase economic growth. The guns-butter tradeoff can manifest in budgetary natural resources and capital stock tradeoffs.

Opportunity costs rise when resources are scarce and can be used in multiple ways. Commitment of government expenditures to defense leads to a shortage of funds for public welfare projects (Heo, 1998; Yildirim & Sezgin, 2002). Since education and health are major indicators of economic growth, defense spending is believed to lower growth by reducing both public and private expenditures for human capital formation. On the other hand, well-educated defense people who work in the civilian sector after their retirement improve the quality of human resources in the civilian sector. The experiences that they had in the military sector can be transmitted to other sectors of the economy (Looney & Frederiksen, 1986b).

An increase in defense spending enlarges the gap between savings and investments by reducing potential savings available for planned investments and thus retarding growth (Değer, 1986). Moreover, because defense spending is a government

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[2] "Economists use the notion of a societal production possibilities frontier to illustrate concepts of scarcity, tradeoffs, choice, full employment, and efficiency. The classic example is to take "guns" as one output, and "butter" as the other. In more general terms, the guns-butter tradeoff can refer to any society's more general, and real-world, choice between becoming a more militarized society ("guns") and becoming a more civilian- or consumer-oriented society ("butter*")."* (Goodwin et al, 2007).

expenditure, "each increase in defense spending brings either a heavier tax burden or a bigger government budget deficit or both" (Chan, 1988). Critics claim that defense spending is a waste of resources and crowds out valuable civil investment.

Looney and Frederiksen (1986b) draw attention to the consequences of how defense spending is financed. If a substantial part of armament is imported, an increase in defense armament can cause a balance-of-payment problem on the economy. If imports are financed by external loans, the external debt rises. In the long run, a balance-of-payment problem generates or aggravates inflation, which reduces the economic competitiveness of a country. If imports are financed through export earnings, the opportunity cost of shifting resources to defense use should be considered. According to Looney and Frederiksen (1986b), this is one of the evidences "why no consistent relationship has emerged between growth and defense". Moreover, Değer (1986) argues that analyzing the impact of the cost of armament imports as a proportion of a defense budget is difficult because of the lack of available data on armament imports.

b.   Positive Externalities—Spinoff and Spillovers

Although the supply-side approach suggests an overall adverse affect of defense spending on economic growth, positive spillover effects of defense spending have nonetheless received attention in the literature reviewed for this thesis.

The spinoff effect means a positive correlation between defense spending and growth (*ceteris paribus*) by enhancing aggregate demand and causing more innovations in both products and processes (Değer, 1986). Furthermore, defense programs provide employment, education, and vocational/technical training for a large number of people. Therefore, defense spending relieves the private sector's social and financial burden in a significant manner (Benoit, 1973, 1978; Değer, 1986; Heo, 1996). For example, Air Force pilots may fly civilian planes after retirement, and health professionals, as well as technicians trained in the military, may also work in the private sector after discharge.

The spinoff effect is not restricted to manpower. The civilian sector also can receive benefits of the technology spillover. Defense R&D is seen as a means of promoting the growth of high technology sectors, such as aerospace and electronics, which in turn provides valuable spinoffs for the civilian economy. Using military technology in the civilian sector sustains a competitive advantage for a firm in both the domestic and international market.

Military R&D, and subsequent innovations, may be used by the civilian sector. For example, a radar device developed under a U.S. Navy contract and then rejected for military use is being adopted for use in hospitals to closely monitor heartbeats without being attached to the skin, making it particularly useful for burn victims (Gold, 1990 as cited in Heo, 1998). Simultaneous usage of military technology in both military and civilian sectors is also possible. For example, in one Turkish Air Force hospital, a low pressure chamber that is used during pilot training is also used in curing diabetics.

Although bombs, missiles, warships, jets, and tanks may be examples of "unproductive" output from defense spending, construction of various categories of infrastructure as well as the consumption and investment arising from defense wages, are not unproductive outputs (Payne & Sahu, 1993, p. 21).

The military remains one of the most modern institutions in LDCs. Thus, the military might provide economic growth by modernization. That is, military defense may "help in creating a socioeconomic structure conducive to growth" (Chowdhury, 1991).

The simple definition of the peace dividend is that if governments cut their military expenditures, there will be greater financial resources to allocate to more socially desirable and productive uses of resources (Intriligator, 1996 as cited in Heo, 1998). However, it is not very easy to cut defense spending to gain a peace dividend for a country that experiences instability in both internal and external environments.

2. The Demand-side Effects

Keynesians focus on defense spending as a component of aggregate demand. The Keynesian perspective generally assumes idle resources (i.e., labor and capital) are available in the economy. In an economy with unemployment, higher military spending increases aggregate demand which leads to increased national output and higher employment. On the other hand, if the economy is already at full employment, higher military spending might well be inflationary, or could be associated with balance of payment problems (Smith & Smith, 1983). However, the LDCs usually suffer from high unemployment and low consumption due to a lack of aggregate demand.

Keynesian Theory concludes that the net effect of defense expenditures on growth is positive and "in the presence of inadequate effective demand the operation of income multiplier would imply an increase in national product, resulting from additional defense expenditures" (Looney, 1989). Additional demand and output from the defense expenditures will increase the utilization of capital stock while reducing resource costs, thereby increasing the rate of profit and possibly accelerating investment as well as employment of labor (Looney, 1994). Therefore, the economy will experience both a short-run multiplier effect now and higher rate of growth in the future (Değer, 1986).

One can divide these positive effect advocates into two sub-groups based on the nature of causality. The Keynesian view advocates causality from government expenditure to economic growth while Wagner's Law[3] implies a reverse direction of causality (see also Abu-Bader & Abu-Qarn, 2003).

3. Security Effects

Adam Smith, (as cited in Dunne et al., 2003), notes that the first duty of states is "that of protecting the society from the violence and invasion of other independent societies…that of protecting, as far as possible, every member of society from the injustice or oppression of every member of it."

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[3] "Wagner's Law states that the development of an industrial economy will be accompanied by an increased share of public expenditure in GNP." (Wagner's Law, 2007).

Another positive side of military expenditures is a safe environment for members of the society. Security from domestic and foreign threats is crucial for investment and innovation. A safe environment encourages both foreign and domestic investments, and therefore stronger economic growth (Benoit, 1973; Değer, 1986). A strong military will also provide a stronger position for national leadership in negotiating with other countries in economic, trade or security matters (Ram, 1993 as cited in Heo, 1998).

However, defense spending can have negative international externalities, perhaps resulting in an arms race.

> The Richardson model shows that states arm in response to the threats they believe to come from rival states. A state will increase its defense spending in response to the higher military spending of its rivals and that its response is also affected by grievance and fatigue or economic factor (Richardson, 1960 as cited in Hartley et al., 1993, p. 40).

Another argument on the security effects of defense spending is about causality, namely if defense expenditures are exogenous to economic growth (Heo, 1996). If there is a positive correlation between defense spending and economic growth, the direction of causality between these variables may vary. An increase in economic performance may reveal a need for an increase in military expenditures to reinforce the county's economy and therefore guarantee the protection of the national economy against internal and external threats.

The level of defense spending depends on how threatened the government feels and how much the government is willing to pay (or can afford to sustain) for the desired level of security. Therefore, the effects of defense spending depend also on security policy, fiscal policy, and foreign policy.

4.   What Makes the Economic Effects of Defense Spending Different?

Defense spending has been an important component of government expenditures both for developed countries and LDCs. The economic effects of defense spending in each type of country differ. An increase in defense spending implies a rise in aggregate demand for the developed countries. An increase in demand is met by an increase in

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production of goods and services which causes higher income and employment in the economy of the developed countries. Military R&D and spillover may also increase private sector productivity. On the other hand, for the developing countries, an increase in defense spending most likely takes resources away from productive investments. Defense demand in many developing countries is met by imports. Import-oriented defense technology can not use the advantage of the spillover that could have favorable effects on the economy (Payne & Sahu, 1993, p. 3).

However, the effects of military spending on economic growth are not consistent among LDCs. As an example, Chowdhury (1991) tried to find "reciprocal influences" between defense spending and economic growth for the 55 LDCs. Instead of a cross-sectional approach across countries, he analyzed time series of each individual country, seeking presence and direction of causal relationship among the variables. The results suggested that the relationship between economic growth and defense spending can not be generalized across the developing countries. He concluded, "The actual relationship may vary by countries due to the use of sample periods, to differences in socioeconomic structure and type of government in each of these countries." According to Heo (1998), there could be three factors that make a difference in terms of the economic effects of defense spending on growth:

> …the level of defense burden due to opportunity cost, economic prosperity due to the nation's economic capacity to handle the opportunity cost, and regime type of the government due to the difference in the openness of the market and the level of government control over market.

O'Leary and Coplin (1975) suggest an investigation of the economic environment of a country, internal political factors, external threats, military alliances, military and strategic factors to explain the variance of defense spending patterns (and therefore defense burdens) among countries.

Frederiksen and Looney (1982) use data for the time period 1960-1978 and separate countries into financially resource-constrained and resource-unconstrained groups. They include investment and defense as independent variables for the growth

equation. They conclude that "increased defense spending fostered economic growth in the unconstrained group, but had little discernible effect in resource constrained countries" (as cited in Looney & Frederiksen, 1986b).

Looney and Frederiksen (1986b) find out that "increased military expenditures retard growth in countries which are experiencing foreign-exchange constraints, while helping development in those that are relatively well endowed with resources." They conclude that since some African economies have limited access to international capital markets and relatively poor export performance, it is not accurate to have a general opinion that additional defense spending has a negative impact on economic growth for all African countries.

Looney (1988a) offers a broad-scope econometric analysis that includes data from 77 LDCs. He indicates that the economic environments of arms producers differ from those of non-producers. Therefore, he analyzed countries in two groups by distinguishing arms producers and non-producers. His results show that military burden does not appear to have a significant impact on these LDCs as a whole. Both the impact of military expenditures on various aspects of the economy and priorities in military budget vary between these two different groups of countries.

Looney (1988b) argues that "budgetary 'trade-offs' provide additional evidence that increase spending on defense tends to improve the general 'quality of life' in non-conflict states and to reduce it in others [conflict states]."[4] He also states that additional defense spending may have a different impact on each country, depending on how much of a portion of the defense expenditures is afforded to health and education.

Regime types also make a difference in the economic effects of defense spending. For example, "military regimes may have tighter controls over markets and be less open to trade, whereas more democratic governments adopt free market principles and open trade policy" (Heo, 1998). Disbursement and spending of a defense budget, and therefore

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[4] Looney (1988b) uses Robert Rothstein's 'Legitimacy-Threats Matrix for Developing Countries' to define the non-conflict and conflict states. "Non-conflict states are *defined as those with medium to high levels of governmental effectiveness and/or low threats*. Conflict states are *defined as those with low governmental effectiveness*."

efficiency and effectiveness of defense spending, may change depending on the regime type of a country. However, Heo (1998) found no systematic pattern in the relationship between regime type and the economic effects of defense spending on growth.

B.   CONCLUSION

Defense expenditures have advantages and disadvantages as policies to promote economic growth. The neoclassical approach states that the opportunity cost of defense spending is significant and diverts scarce resources away from more productive uses. Defense expenditures can hinder growth through a crowding-out of investment or civilian programs such as health spending and infrastructural improvement. The defense burden affects economic growth directly through increased demand, technological spinoff, and modernization of attitudes, and indirectly through increased supply of skilled labor and decreased investment. Also, military spending can encourage economic growth through Keynesian aggregate demand effects. Growth in demand due to defense spending leads to an increase in the utilization of capital stock, greater employment and profits, and therefore greater investment. Defense spending also sustains a more favorable security environment that is crucial for the efficient operation of civilian markets, such as consumer, industrial, and stock markets. The level of defense spending for sustaining a secure environment requires security, fiscal, and political policies.

The question of the net benefit of defense expenditures on growth has important policy implications, especially for developing countries. However, past research strongly indicates there is no universal answer. Accordingly, an empirical study in this thesis will focus on Turkey as its case study.

V. DIFFICULTIES OF MILITARY EXPENDITURE STUDIES

Empirical studies on military expenditures have important policy implications, since each country spares a considerable amount of budget share for defense. As explained in Chapter IV of this thesis, consequent effects of the level of military expenditures differ by countries depending on various factors. Military expenditures themselves may also cause a different result. There are several difficulties that researchers of military expenditures deal with. In this chapter firstly, existent conceptual (definition), methodological, and practical (collecting) difficulties in the collecting and processing of statistical data on military expenditures are stated. Secondly, the primary source of information on military expenditures and how existing problems affect these sources are explained. After that, the measures of military expenditures are displayed. Being aware of all these difficulties may prevent wrong implications. It is important to be able to measure military expenditures correctly, if possible, because the results of defense economics studies may affect the regional force balance. If not, knowing the deficiencies and constraints of studies becomes crucial before making any policy implementation.

A. CONCEPTS, METHODOLOGICAL, AND PRACTICAL PROBLEMS

1. Problem in the Definition of Military Expenditures

Military expenditures would be defined, in a simple way, as being all the human resources and material dedicated by a country to its defense "[first] to guarantee its national independence, the integrity of its territory and, where appropriate, the respect of the international treaties binding to country to foreign states [secondly] to maintain internal security and public order" (Herrera, 1994, p. 13). Even this simple definition requires separation of resources employed by a state to maintain security from all other resources used for other governmental expenditures. However, separating each governmental expenditure into military and civilian categories is not easy because of intertwined military and civilian functions of the state.

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"The definition of military expenditures may vary considerably from one county to another due to differences in classification and accounting and in the way in which the state budget is drawn up" (Herrera, 1994, p. 14). In some countries, the responsibility of the Ministry of Defense includes some civilian activities. For example, besides its responsibility for armed forces, the Ministry of Defense of Saudi Arabia is responsible for the civil aviation authority and for meteorological services. Conversely, there may be civilian-budgeted expenditures that benefit the military sector. For example, research and development expenditures in the nuclear and space fields are financed by the civilian sector; however, some applications of these sectors are directly military related (Herrera, 1994, p. 14). Moreover, the role of the armed forces changes in some countries. For example, as in the French gendarme, job discrimination between police and armed forces is not certain (Giray, 2004).

Each country is free to define its military expenditures on behalf of its benefit; hence there is no standard definition (Brzoska, 1995 as cited in Lebovic, 1999). There are three basic definitions of military expenditures (see Appendix B). The North Atlantic Treaty Organization (NATO), the International Monetary Fund (IMF), and the United Nations (UN) have developed standardized definitions which are used by some other institutes and agencies that have database on military expenditures. The main differences among the definitions include the following: ambiguity on whether or not the treatment of external military aid should be included or excluded from military expenditures; financing of military pensions which is included in the NATO definition but not the IMF definition; ambiguity on expenditures pertaining to security forces like gendarme and border guards which are parts of military force and participants of civilian security tasks; research and development expenditures (see also Brzoska, 1995, pp .46-49 as cited in Giray, 2004; Herrera, 1994, pp. 15-16).

A lack of a standard definition of military expenditure creates variance in military expenditure figures. For example, military expenditures in the German national budget is estimated as DM 49,602 for the year of 1993, however when the NATO definition is applied this number increases to DM 63,853 (Brzoska, 1995, pp. 51-52 as cited in Giray, 2004).

## 2.	Methodological Problems

Inflation and domestic currency vary from one country to another over time; thus, some methodological problems are revealed in statistical studies which include data over time and by country. Inflation and currency variances require estimating military expenditures in real terms and converting the expenditures expressed in national currency into a common currency, generally U.S. dollars. Therefore, choosing an appropriate deflator and conversion factor are the two important methodological problems encountered in comparing military expenditures.

### a.	Deflator Factor

Inflation is defined as the increase in the price of some set of goods and services in a given economy over a period of time. Deflator is a statistical tool used to convert current dollars into inflation-adjusted currency in order to compare prices over time after factoring out the overall effects of inflation (Investor Words Financial Glossary). Some deflators should be used to compare military expenditures of different years.

Inflation is valid for the price increase for a certain amount and quality of goods over a time period. However, price increases due to increased technology and therefore quality is quite possible, especially for weapon systems. This quality increase must be separated from actual inflation (Brzoska, 1981). This argument reveals the requirement of separating price increases into two components, namely inflation and quality increase. Brzoska (1981) acknowledges that it is impossible to manage this separation because of the difficulty of comparing quality change in military products as well as in military personnel productivity. He also points out another problem as follows; "inflation in the military sector outpaces inflation in the civil sector." also In addition, he acknowledges that for this reason a specific country (Western Germany) used a special military inflation index rather than an industrial production index.

b. Conversion Factor

The economic data of different countries that is expressed in units of national currency can be compared by using the international transaction approach (i.e., market exchange rate) or the purchasing power parity (PPP) approach. Each approach is generally used to convert the GDP into a common unit. However, each approach has weaknesses that cause loss of reliability. Market exchange rate "turns out to be an unsatisfactory solution for many purposes – primarily because exchange rates reflect so many more influences than the direct price comparisons that are required to make volume comparisons" (Schreyer & Koechlin, 2002). The market exchange rate does not reflect the prices of non-traded goods. For the second approach, "PPPs are price relatives, which show the ratio of the prices in national currencies of the same good or service in different countries" (Schreyer & Koechlin, 2002). PPP provides volume comparisons. Using PPP as a conversion factor requires the separation of each component of military expenditures. For example, "for military personnel, the parities can be estimated on the basis of the remuneration paid and the total cost of maintaining the armed forces, by ranks and status weighted by total numbers, in comparison with the corresponding costs in other countries" (Herrera, 1994, p. 18). However, there is not sufficient and accurate data related to military expenditures. The main discrepancy of PPP is that PPP numbers can vary with a specific basket of goods which may differ in their contribution to welfare in each county.

Local prices differ from international prices due to various national taxes and regulations. Therefore, the exchange rate approach can be dependable for tradable goods but not for all domestic foods. Although PPP has weaknesses that limit its value, PPP is preferred over the exchange rate approach in statistical studies.

Brzoska (1981) argues that applying a deflator for the inputs of military expenditures provides a correction of the military sector output to real time series. If the main concern is about the opportunity cost of military expenditures rather than the output of military expenditure inflation, characteristics on those alternative sectors should be

known. "Theoretically two issues must be considered here: 1. Can we estimate where milex money would be spent alternatively? 2. Does the composition of possible alternative uses of milex change from year to year?" (Brzoska, 1981)

3.   Problems in Collecting Data

The secret nature of the military expenditures creates a significant data confidence problem. "In the great majority of countries, if not all of them, information concerning questions of national defense is surrounded by opaqueness, symptomatic of the eminently political nature of this subject" (Herrera, 1994, p. 23). Secrecy is preferred over opaqueness because it prevents information for existing or potential opponents. The level of military expenditures or change in military expenditures can be regarded as an indicator of government intent; therefore governments may want to hide their level of armament. Also, some countries "might understate spending to calm adversaries and domestic critics" (Brzoska, 1981). Due to this strategic dimension of military expenditures, "opacity" is a desired action for many countries. Consequently, some countries manipulate foreign trade accounts to disguise the purchasing of weapons by identifying those expenditures as purchases of capital goods for the civilian sector (Ball, 1988 as cited in Herrera, 1994). However, the strategic importance of the defense budget should not be overestimated, since even if the budgeted cost is known, it does not give explicit information whether or not a country has a defensive or offensive defense strategy (Herrera, 1994, p. 39). Moreover, objective information on military spending can help to decrease international tension by preventing conflict. Transparency in military issues is a crucial element for building thrust among countries. Transparency should be sustained not only for quantity but also for quality of information. Overall military spending may not be very useful, so including detailed information of defense spending on things such as personnel, equipment, R&D, operations and maintenance, and so on would be preferred.

There may be some missing military data for some countries for some periods. The reason may be because some countries do not keep track of detailed military expenditure data or do not want to share this information. However, excluding those

countries due to incomplete data is not a preferable method while making international comparisons. Creating a dummy variable is a general method to complete the missing data. "Usually, the most recent available figure for military burden was applied to the current level of GNP, sometimes a subsequent figure was used as a best guess and occasionally, missing years were interpolated when there had been a big change" (Dunne & Perlo-Freeman, 2003).

4. Conclusions

Military expenditures as a figure are an input measure which shows how much is spent for military purposes. However, military expenditure as a figure does not provide any information about the quality, strength, or capabilities that can be considered as output measures. Applying a cost-benefit analysis to sustain the cost-effectiveness changes the level of output independently from the input measures of money spent. However, a military expenditure figure can be used to estimate the opportunity cost, 'gun-butter tradeoff', or its effect on the overall economy as explained in Chapter IV of this thesis.

Different definitions, price deflators, and choice of exchange rates make the international comparison difficult and the available data less reliable. Moreover, only limited data is available for some countries because of secrecy applications which magnify the reliability problem on available data. The reliability problem should be taken under consideration before making any predictions or implications by the researchers, since the usage of misleading measures creates bias and error. All of these differences add up to very large error margins. Using inappropriate data may cause two types of errors in a statistical decision process, namely finding a relationship where it does not exist (i.e., Type II error; not rejecting a false null hypothesis) or rejecting the relationship incorrectly where it exists (i.e., Type I error; rejecting a true null hypothesis).

B. PRIMARY SOURCE OF INFORMATION ON MILITARY EXPENDITURES

Increased interest in defense economics in an environment of conceptual, methodological, and practical difficulties has brought about the requirement of gathering together and adjusting military expenditure data for each country. Several national and international organizations and institutes collect, process, and publish data on military expenditures for many countries over time. The best known of these organizations are the U.S. Arms Control and Disarmament Agency (USACDA or ACDA), the Stockholm International Peace Research Institute (SIPRI), the International Institute for Strategic Studies (IISS), the International Money Fund (IMF), the United Nations (UN), and the Central Intelligence Agency (CIA).

Each organization has a different focus area and uses a different approach in collecting, processing, and publishing data. To provide a general idea on variance, for example, ACDA uses the NATO definition of military expenditures whereas SIPRI uses its own definition. SIPRI uses the consumer price index (CPI) as a deflator for inflation correction whereas ACDA uses the GNP price index. IISS and SIPRI present very recent data; however, more than a full year passes for the latest available data to be published for the ACDA. Compared with SIPRI and ISS, ACDA uses more caution in presenting recent figures (Brzoska, 1981). IISS publishes figures for a limited number of countries, whereas ACDA does not present national currency figures. Both SIPRI and ACDA report data for calendar rather than fiscal yeas.

Each organization publishes its available data under a different title (Table 3). However, many countries publish their data-related military expenditures via various governmental and statistical agencies and institutes.

TABLE 3 Organizations and Their Publications Related to Statistical Data on Military Expenditures

Organization	Title of Publication
IMF	Government Finance Statistics
UN	Report of the Secretary General
SIPRI	World Armament and Disarmament
USACDA	World Military Expenditures and Arms Transfers
IISS	Military Balance
CIA	World Factbook

Note: Titles of publications are collected from each organization's official web page

Table 3.   Organizations and Their Publications Related to Statistical Data on Military Expenditures

Lebovic (1999) examined the reliability of the direction of military spending growth obtained from ACDA and SIPRI sources for the seven different regions (Africa, East Asia, Latin America, Middle East, South Asia, NATO Europe, and the Warsaw Pact) and concluded that

> The direction of ACDA and SIPRI estimates diverge significantly over time and that the two data sources appear especially challenged when estimating the sign of smaller, and especially negative, growth-rate changes and of spending in regions (Africa and the Middle East) where growth rates vary markedly." Herrera (1994) argues that "the use and value of their statistics may be seen as complementary rather than mutually exclusive… [therefore], it is impossible [and not right] to rely on any one particular database.

An examination of each organization's regulation and publications, as well as previous analyses by Brzoska (1981), Herrera (1994), and Lebovic (1999) are highly recommended for a detailed comparison and explanation on collecting, processing, and publishing data variances on military expenditures.

C.   MEASURES OF DEFENSE EXPENDITURES

There are different options to choose from for comparing military expenditure figures. Military expenditure can be measured as a level depending on the change in the figures. Examining levels of spending has the disadvantage of auto-correlation which

means previous levels of spending largely determine future spending. However, advance statistical methods can overcome this drawback. Annual changes may also be used to find out the determinants of defense spending.

Absolute and relative measures are commonly used. An absolute level of military expenditure shows the actual sum of defense-related spending. An absolute measure is more preferable for comparative analysis in common currency and military potential analyses. However, using absolute measures creates some discrepancies; firstly, it is independent from economic capacity and size of the population. Secondly, using absolute measures requires using a deflator, and using a deflator creates methodological problems as previously described in this chapter.

Relative defense expenditures are more frequently used than absolute measures. "Shares have the advantage that they take account of incomes, are insensitive to inflation and exchange rates, and can be used as signal or a measure of commitment to defense" (Smith, 1989 as cited in Georgious et al., 1996). The most common relative indicators are as follows:

- Armed forces per person

- Military expenditure as a percent of GDP (i.e., defense burden) - measures the portion of a country's overall economy that is devoted to defense

- Military expenditures as a percent of governmental expenditures (i.e., budget ratio) - measures the portion of a government expenditure that is devoted to defense

- Military expenditures in dollars per capita - measures how much a country devotes to defense relative to the size of its population

- Military expenditures per military member - measures how much a country devotes to defense relative to the size of its military population

Defense burden and budget ratio have been commonly used to measure defense spending in the literature. Although each measure has deficiencies, the one that should be selected depends on the study's objective. "Ball (1984) argues that if the researcher is interested in budget allocation and hence government priorities, then the relevant measure

is the budget ratio. On the other hand, if the researcher is interested in the effects of defense spending on economic development, then the relevant measure is the defense burden" (as cited in Kwabena, 1992).

The most commonly used burden measure is the military expenditure as a percentage of GDP. It indicates the burden that defense places on the economy of each country, automatically adjusting for differences in national income. Besides this, it measures a country's overall level of effort, regardless of how it allocates its defense budget.

It is also worth to say that participation in peacekeeping missions, contributions to reaction forces, and economic assistance to some particular union are some other indicators of military expenditures which are used for different objectives.

VI.   EMPIRICAL CASE STUDY

A.   TURKISH   DEFENSE-GROWTH   AND   DEFENSE-WELFARE TRADEOFFS

1.   Theory and Model

The literature on the negative effects of defense spending focuses on two kinds of tradeoffs - the growth tradeoff ('guns versus growth' tradeoff) and the defense-welfare tradeoff (the 'guns versus butter' tradeoff). The opportunity cost of military expenditures in terms of economic growth is measurable in the tradeoff between military expenditures and investment. The growth effect hypothesis states that increased defense spending limits the resources that might otherwise go to investment, and therefore reduces economic growth. The allocation effect, on the other hand, implies that military expenditures lead to fewer resources for welfare programs such as education and health.

The association between investment, borrowing, military expenditures, and economic growth is investigated in the first part of this empirical study. To test the impacts of military expenditures on economic growth in Turkey, the following growth model is developed.

$$GGDPC_t = \alpha_0 + \alpha_1 PFI_t + \alpha_2 EBGS_t + \alpha_3 MILEX_t + \alpha_4 DUM + \varepsilon_1 \qquad (1)$$

where

GGDPC = growth rate of gross domestic product per capita,

PFI = public total fixed investment as a share of gross domestic product

EBGS = external balance on goods and services as a share of gross domestic product

MILEX = military expenditures as a share of gross domestic product (defense burden ratio)

DUM = dummy variable(s) (if needed)

The growth rate of GDP per capita is chosen as the dependent variable. Levels of GDP per capita are obtained by dividing annual nominal GDP at current market prices by the population. It is a basic economic growth indicator and measures the level and extent of total economic output. The growth in GDP per capita reflects changes in the total production of goods and services. The growth rate was used to eliminate the inflation effect. PFI is chosen as an indicator of investment and the associated coefficient is hypothesized to be positive. The external balance term makes sense, with larger capital inflows as the growth rate increases. External balance on goods and services is the difference between exports of goods and services and imports of goods and services. If it is positive, the economy exports more goods and services than it imports, and vice versa. EBGS is chosen as an indicator of borrowing, and the coefficient is hypothesized to be negative since Turkey has an import-oriented economy. Lastly, the military expenditure as share of GDP is used to measure the portion of the overall economy that is devoted to defense and the coefficient is hypothesized to be negative. The proportion of each independent variable in GDP was taken to eliminate the inflation effect and avoid using a deflator as well as methodological problems discussed in Chapter V. A dummy variable is needed to account for some event or structural change, which will be introduced later in this chapter, that if not recognized will distort the size of the coefficients.

The direction and level of the budgetary tradeoff between military expenditures and health and education for Turkey is investigated in the second part of the empirical study. The main argument suggests that education and health are among the major sources of economic growth, especially for developing countries. Within the limited budget of a country, increases in military expenditure will cause an equivalent decrease in other budget categories like education and health. In other words, total budget expenditures might not increase with increased defense expenditures (Günlük-Şenesen, 2002). Military expenditures are thought to reduce public expenditures on human capital formation, therefore limiting the economic growth (Yildirim & Sezgin, 2002). However, defense spending may contribute to human capital formation in education and health (Ram, 1993). Furthermore, defense programs provide employment, education, and vocational/technical training for a large number of people. Therefore, defense spending

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relieves the private sector's social and financial burden significantly (Benoit, 1973, 1978; Değer, 1986; Heo, 1996). In addition, some argue that there is no tradeoff between military expenditures and economic growth (David & Chan, 1990; Frederiksen & Looney, 1994). The direction and level of budgetary tradeoff between military expenditures and health and education for Turkey is investigated under the following equations.

$$HESS_t = \beta_0 + \beta_1 EDU_t + \beta_2 MLX_t + \beta_3 DUM + \varepsilon_2 \quad \text{(Health equation)} \quad (2)$$

$$EDU_t = \chi_0 + \chi_1 HESS_t + \chi_2 MLX_t + \chi_3 DUM + \varepsilon_3 \quad \text{(Education equation)} \quad (3)$$

where

HESS = health and social security expenditure as a share of the consolidated budget

EDU = education expenditure as a share of the consolidated budget

MLX = military expenditures as a share of the consolidated budget

DUM = dummy variable(s) (if needed)

The proportion of each independent and dependent variable in the budget were taken once again to eliminate inflation. A dummy variable is needed to avoid distortion in the size of the coefficients due to an event that will be discussed later in this chapter.

2.   Data and Method

The association between investment, borrowing, military expenditures, and economic growth is investigated for the period between 1969 and 2004. Data for the model in Equation (1) came from several sources. Defense expenditures as a share of GDP data were taken from various issues of SIPRI Yearbooks (The Stockholm International Peace Research Institute). Public total fixed investment as a share of gross domestic product data was obtained from the SPO[5] (State Planning Organization of

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[5] It is noted that based on the Turkish SIS (State Institute of Statistics) new GNP series were used after the year 1987 in this data set.

Republic of Turkey). The growth rate of gross domestic product per capita as well as the external balance on goods and services as a share of gross domestic product data were taken from the World Bank database.

For the second part of the empirical study, data for the budget shares of health[6], education[7], and military expenditures[8] are taken from Turkish Ministry of Finance General Directorate of Budget and Fiscal Control database. The data covers the period between 1973 and 2005.

Data consistency for Turkey is hard to achieve, even for a short period of time (Günlük-Şenesen, 2002; Yildirim & Sezgin, 2002). The military has high schools, academies at the university and postgraduate levels, and war colleges at the postgraduate and higher levels. All of the military education institutions give certificates and diplomas which are approved by the Turkish Ministry of Education. In this context, some part of the money spent on the military goes directly to education, whereas these expenditures are not included in education spending but rather in military spending.

Education and health expenditures are mixed in Turkey. University hospitals are included in education but provide a health service. Therefore, some part of the health expenditures of these university hospitals are counted as educational expenditures.

Also, the military has hospitals which serve not only military personnel and their families but also civilians. Some parts of the military budget directly go for health but are counted as part of military expenditures.

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[6] Allocated budget share of the Ministry of Health of Turkey was taken as health expenditures. The Ministry of Health of Turkey was named the Ministry of Health and Social Security until the year 1990 in the consolidated budget reports.

[7] Allocated budget share of the Ministry of National Education of Turkey was taken as education expenditures. The Ministry of Education was named the Ministry of National Education, Youth Affairs and Sports until the year 1990 in the consolidated budget reports.

[8] For the years between 1973 and 1984, the defense budget was the sum of the Turkish Ministry of National Defense and Turkish General Command of Gendarmerie. For the years after 1984, the Turkish Coast Guard Command, whose budget was separate from the Turkish General Command of Gendarmerie and was added to the consolidated budget as a new allocated area, was added to compute the overall military expenditure. The budget does not include extra-budgetary figures such as the Under-Secretariat for the Defense Industry (SSM) Support Fund and The Turkish Armed Forces Foundation (TAFF).

To find the relationship between the dependent and independent variables, a multiple regression method is applied using Excel's Analysis ToolPak (Data Analysis). In the first model in Equation (1), military intervention (coup d'état) has to be controlled which creates an outlier in the data in 1980 for all three independent variables - PFI, EBGS, and MILEX. After inspection of the residuals, DUM80 is included in the analysis which takes the value of 1 for the year 1980 and 0 for other years.

Whether the government is civilian or military and whether there is peace or tension may cause variances in the allocation of resources among budget items. In the second model (Equations (2) and (3)) there is a data outlier in 1983, when the military returned the government back to civilian control, for the variables of education and military. A detailed inspection of the budget allocation among institutions concurs with the outlier. The planned budget in the beginning and at the end of each year, and actual expenditure at the end of the year are very close for all years except 1983. Actual expenditure for the Ministry of Defense is 18% lower than the beginning budget of the year 1983. On the contrary, the ending budget for the Ministry of National Education is 33% higher than the beginning budget of the year 1983. It is also very interesting that 18% of the Ministry of Defense budget is almost equal to 33% of the Ministry of Education budget for that year. It seems as if civilian authority transported the budget from defense to education after taking control. Consequently, to control this event, DUM83 is included for both Equation (2) and Equation (3), which takes the value of 1 for the year 1983 and 0 for other years.

3. Findings

Multiple regression output from Excel's Analysis ToolPak for the growth model in Equation (1) is displayed in Table 4.

TABLE 4 Summary Output for the Growth Model in Equation (1)

Regression Statistics					
Multiple R	0.748				
R Square	0.560				
Adjusted R Square	0.503				
Standard Error	2.951				
Observations	36				

ANOVA

	df	SS	MS	F	Significance F
Regression	4	343.009	85.752	9.849	0.0000
Residual	31	269.906	8.707		
Total	35	612.915			

	Coefficients	Standard Error	t Stat	P-value	One-tail P-value
Intercept	3.435	3.225	1.065	0.295	0.147
PFI	0.448	0.343	1.305	0.200	0.100
EBGS	-1.362	0.239	-5.702	0.000	0.000
MILEX	-2.053	0.723	-2.838	0.008	0.004
DUM80	-12.238	3.158	-3.875	0.001	0.000

Table 4.   Summary Output for the Growth Model in Equation (1)

Since the F-Statistic for the F-test of overall equation significance is 9.849 with a p-value of 0.0000, this model has statistically significant explanatory power at any significance level one would usually test. R Square denotes the coefficient of determination. The R^2 value is 0.56 which means that just over half of the variation in GGDPC over these 36 observations is explained by the variation in the following 4 variables: PFI, EBGS, MILEX, and DUM80.[9] Using the 36 observation data set, all of the exploratory variables have the expected sign - MILEX and EBGS have negative coefficients whereas PFI has a positive coefficient. Coefficients with the related p-values[10] indicates that one can conclude, at any significance test level above 0.10, if PFI increases by 1%, GGDPC increases by 0.448% when the other independent variables in the model are not changing. EBGS and MILEX are significant at any usual level of hypothesis testing that one can conclude, and coefficients suggest that if either EBGS or

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[9] Without using dummy variable DUM80, the R^2 is 0.34 and the PFI is insignificant with a one-tail p-value of 0.31.

[10] Since the author makes the directional prediction for each explanatory variable before conducting the test, and the result goes in the hypothesized directions with the statistically significant model at any usual level, the author uses the one-tail p-values for deciding the level of significances.

MILEX increases by 1%, GGDPC decreases by 1.362% or 2.053%, respectively, when other variables in the model do not change. DUM80 has a significant negative coefficient. Other information given in Table 4 supports the findings.[11]

Multiple regression output from Excel's Analysis ToolPak for the health model in Equation (2) is presented in Table 5.

TABLE 5 Summary Output for the Health Model in Equation (2)

Regression Statistics	
Multiple R	0.887
R Square	0.787
Adjusted R Square	0.765
Standard Error	0.341
Observations	33

ANOVA

	df	SS	MS	F	Significance F
Regression	3	12.482	4.161	35.732	0.00000
Residual	29	3.377	0.116		
Total	32	15.859			

	Coefficients	Standard Error	t Stat	P-value
Intercept	1.5840	0.2933	5.4013	0.0000
EDU	0.3062	0.0313	9.7887	0.0000
MLX	-0.1214	0.0272	-4.4685	0.0001
DUM83	-1.4912	0.3521	-4.2351	0.0002

Table 5.   Summary Output for the Health Model in Equation (2)

The model of health in Equation (2) has statistically significant explanatory power at any significance level one would usually test, as the F-Statistic for the F-test of overall equation significance is 35.732 with a p-value of 0.0000. The R^2 value is 0.79 which means that 79% of the variation in HESS over the 33 observations is explained by variation in the following 3 variables: EDU, MLX, and DUM83.[12] Under the 33

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[11] Multiple R is the square root of R square. Adjusted R square adjusts R square for the relative size of the number of explanatory variables (k) to the size of the sample (n). The larger the sample size, the smaller the difference between R square and adj. R square. When the coefficients are divided by related standard error, it gives values of the related T-stats. T-tests test the validity of significance for each individual variable. P-values are directly related to T-stats. SS, MS values and df (degree of freedom) are used to determine standard error and the F-test for overall equation.

[12] Without using any dummy variable, the equation generates a significant model as well as significant explanatory variables. However, the R^2 value increases from 0.65 to 0.79 with adding the dummy variable for the year 1983.

observation data set, MILEX has a negative coefficient whereas EDU has a positive coefficient. Coefficients with the related P-values[13] indicate that EDU and MLX are significant at any usual level of hypothesis testing (with P-values of 0.000) and one can conclude that if either of EDU or MLX increases by 1%, HESS increases by 0.306% or decreases 0.121% respectively when other variables in the model are not changing. DUM83 has a significant negative coefficient.

Multiple regression output from Excel's Analysis ToolPak for the education model in Equation (3) is presented in Table 6.

TABLE 6 Summary Output for the Education Model in Equation (3)

Regression Statistics					
Multiple R	0.930				
R Square	0.864				
Adjusted R Square	0.850				
Standard Error	0.977				
Observations	33				

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	3	176.413	58.804	61.667	0.00000
Residual	29	27.654	0.954		
Total	32	204.067			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	
Intercept	-3.1253	1.0373	-3.0129	0.0053	
HESS	2.5073	0.2561	9.7887	0.0000	
MLX	0.4319	0.0615	7.0268	0.0000	
DUM83	4.1532	1.0239	4.0562	0.0003	

Table 6.   Summary Output for the Education Model in Equation (3)

The P-value of F-Statistics indicates that the education model in Equation (3) is significant at any level. The F-Statistic for the F-test of overall equation significance is 61.667 with a p-value of 0.0000. The R^2 value (coefficient of determination) is 0.86 which means that 86% of the variation in EDU over these 33 observations is explained by

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[13] The two-tail p-values (under the name of 'P-value' in the ANOVA output) are used to decide the level of significances for explanatory variables since the author could not make the directional prediction for each explanatory variable before conducting the test.

variation in the following 3 variables: HESS, MLX, and DUM83.[14] Under the 33 observation data set, MILEX and HESS have positive coefficients. Coefficients with the related P-values[15] indicate that HESS and MLX are significant at any usual level of hypothesis testing (with P-values of 0.000) and one can conclude that if either of HESS or MLX increases by 1%, EDU increases by 2.507% or 0.432% respectively when other variables in the model are not changing. DUM83 has a significant positive coefficient.

4.   Conclusion and Policy Implication

The primary purpose of this chapter was to test the relationship between military expenditures and economic growth in the first part, and assess the defense-welfare relationship in the second part of the study. A causal multiple regression method was applied by using Excel's Analysis ToolPak (Data Analysis). Results for each model were statistically significant.

The results of the first part of the empirical study support hypothesized linkages between economic growth and independent variables. The positive linkage between investment and economic growth supports the hypothesis that investment is an important determinant of growth. The external balance on goods and services has negative values for Turkey. Turkey imports more goods and services that it exports. Also, the model showed that the external balance on goods and services has a negative effect on economic growth in Turkey. That is, the results suggest the negative linkage between military expenditure and economic growth.

Depending on the growth model results, reducing military expenditures can be expected to increase growth due to the negative linkage between military expenditure and economic growth. If more capital resources are used in the civilian economy following defense cutbacks, then this result is plausible. However, both external and internal security concerns make it difficult to decrease defense spending for Turkey.

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[14] Without using any dummy variable, the equation generates a significant model as well as significant explanatory variables. However, the R^2 value increases from 0.79 to 0.86 with adding the dummy variable for the year 1983.

[15] The two-tail p-values (under the name of 'P-value' in the ANOVA output) are used to decide the level of significances for explanatory variables.

In the second part of the empirical study, the defense-welfare relationship for Turkey was tested under the two different equations of health and education. The empirical findings suggest there are tradeoffs between military expenditures and welfare spending. However, the tradeoff between military expenditures and either health or education is different. While there is a negative relationship between military and health expenditures, the relationship is positive for education. These results support the hypothesis that increased defense expenditures reduce resources available for health, but do not crowd out education. Health expenditures imply that defense has a priority in the budgeting process over health expenditures. Also, the tradeoff between education and health is positive in both Equation (2) and Equation (3). The results should be interpreted carefully with knowledge of the data consistency problem stated above.

It is interesting to note that when the dummy variable is left out of each equation and each model is estimated again, the coefficient of determination turns out to be a significantly lower number. Also, the dummy variable in each equation is significant at any usual level of testing. The dummy variable in the growth model in Equation (1) supports the idea that the effects of the three independent variables PFI, EBGS, and MILEX caused relatively lower economic growth in 1980 when military intervention took place than in other years. A negative coefficient result of the dummy variable in Equation (2) and positive coefficient result of the dummy variable in Equation (3) show that in 1983 when the civilians retook control from the military, the effect of education and military expenditures on health expenditures was relatively lower than the overall trend, whereas the effect of health and military expenditures on education expenditures was relatively higher.

Now that military expenditures have detrimental effects on economic growth and there is a negative tradeoff between health and military expenditures, is it feasible to recommend that Turkey should decrease its level of military expenditures? The next chapter will provide a perspective on the reasons for Turkey's increased defense expenditures as result of Turkey's economic environment, external threats, military and strategic factors.

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VII. UNDERSTANDING TURKISH DEFENSE EXPENDITURE

Defense burden (i.e., defense spending as a share of GDP) varies by country depending on the economic, social, and political dimensions of both domestic and international environments. O'Leary and Coplin (1975) suggest an investigation of the economic environment of a country, internal political factors, external threats, military alliances, and military and strategic factors to explain the level and trend of defense spending of a country.

The empirical study discussed in Chapter VI revealed that there is a negative tradeoff between military expenditures and both economic growth and health. The main purpose of this chapter is to answer the following questions:

- What makes Turkey's military expenditures relatively high?
- Is it possible to draw inference that high military expenditure is a requirement for Turkey?

To answer these questions, firstly, the general trend in Turkish military expenditures, its sources, and allocation will be displayed. The remaining part of the study will focus on the following factors that are predicted to be major reasons for the high military expenditures: strategic factors, conflict with PKK terrorism, disputes with Greece, the military modernization program, and the economic environment of Turkey. The author acknowledges that there are more factors that affect the level of military expenditures in Turkey; however, investigating all those variables is very difficult. The purpose of this chapter is not to analyze the legal or political status caused by the factors that will be explained, but to provide a point of view based on the information of those factors' importance and significance on Turkey's high level of military expenditures.
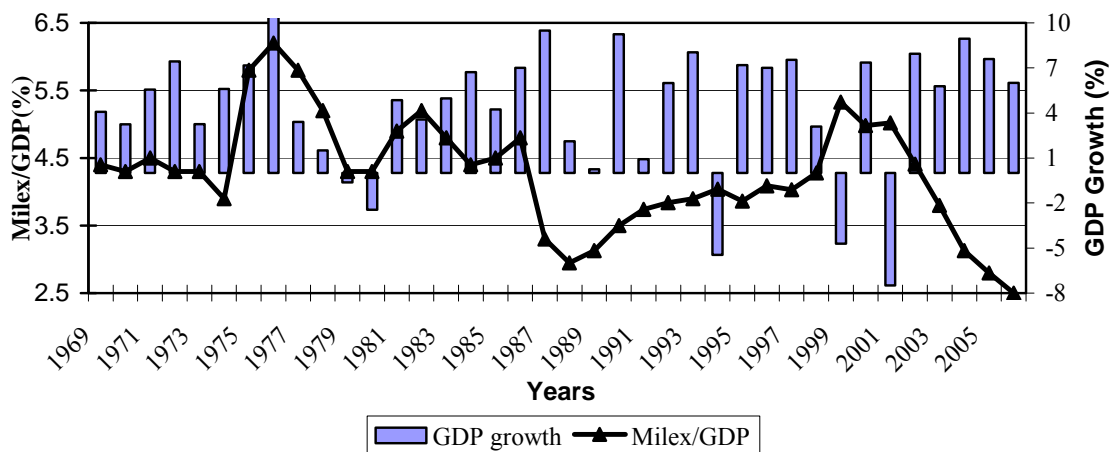
A. TURKISH DEFENSE EXPENDITURES

1. Turkish Defense Burden

Turkey initiated an economical liberalization in 1980 and has experienced high interest and inflation rates, volatile growth rates, high unemployment rates, and high

fiscal deficits during its economical liberalization and privatization history. Despite its economic distress, Turkey has been leading in arms imports. Although defense spending as a percentage of the gross domestic product has varied over time, it has always been relatively higher than the most of the European and NATO countries. Turkey's high-standing defense burden had continued even in the years of economic crises (see Figure 2).

Absolute and relative measures are commonly used to indicate the level of military expenditures and make future predictions depending on trend. The absolute level of military expenditures shows the actual sum of defense-related spending. Relative defense expenditures are more frequently used than absolute measures since they can be used as a signal or measure of commitment to defense while disregarding the methodological problems (see Chapter V for detailed information).

FIGURE 2 Turkish Defense Burden Ratio versus Annual GDP Growth 1969-2006

Data Source: GDP growth, World Bank; Milex/GDP, SIPRI
GNP data for the year 2006 is taken from Ministry of Finance database

Figure 2.   Turkish Defense Burden Ratio Versus Annual GDP Growth 1969-2006

Figure 2 provides the Turkish defense burden ratio versus annual GDP growth for the period 1969-2006. The defense burden ratio (military expenditures as a percent of GDP) indicates the burden that defense places on the economy of a country, automatically adjusting for differences in national income. In addition, it measures a

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country's overall level of effort, regardless of how it allocates its defense budget. Since it is a relative measure, knowing the change in each component, namely military expenditures as well as GDP, helps to understand the change in the defense burden. Figure 2 shows that Turkey had a high military burden for the years prior to 1974 with an average of 4.4% of its GDP. There is a considerable increase and decrease in the defense burden ratio in the years 1974 and 1987 respectively. Turkey steadily increased its defense burden ratio after 1988 until 2002. Its high-standing defense burden continued even in years of economic crises in 1994, 1999, and 2001. Following the year 2002 Turkey decreased its defense burden ratio.

The previous explanation makes more sense if one looks at both figures of defense burden ratio and GDP growth ratio in Figure 2. For example, the steady decrease in the defense burden ratio after the year 2002 may be due to the continuing positive GDP growth. One can claim by mistake that the defense burden decreased after the year 2002 just because of continuous increase in GDP independent from military expenditures in real numbers. Since the defense burden ratio is a relative number, a change in value may happen because of change in military expenditure or GDP or a change in both. Looking at the military expenditures in real numbers, besides the relative ones, may prevent misreading issues.
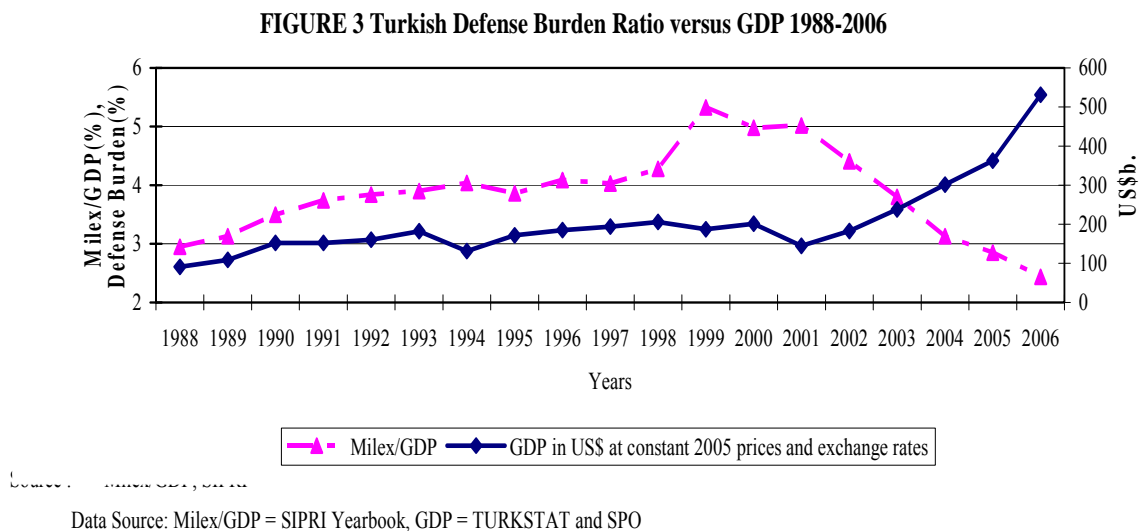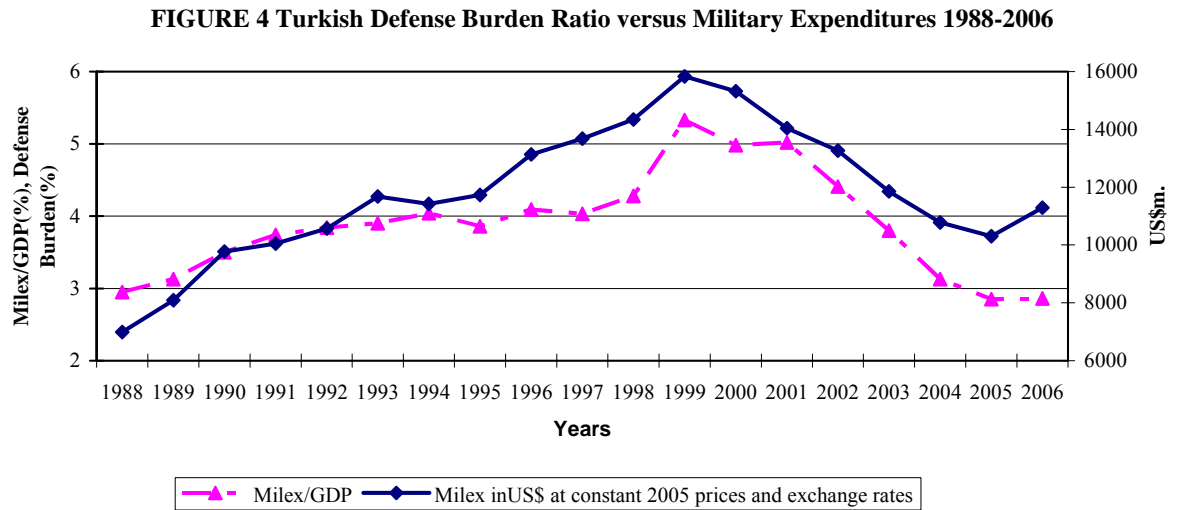
FIGURE 3 Turkish Defense Burden Ratio versus GDP 1988-2006

Data Source: Milex/GDP = SIPRI Yearbook, GDP = TURKSTAT and SPO

Figure 3.   Turkish Defense Burden Ratio Versus GDP 1988-2006

FIGURE 4 Turkish Defense Burden Ratio versus Military Expenditures 1988-2006

Data Source: SIPRI Yearbook

Figure 4.   Turkish Defense Burden Ratio Versus Military Expenditures 1988-2006

Looking at Figure 3 and Figure 4 concurrently reveals that the steady decrease in defense burden for the period between 2002 and 2005 is not only because of the steady increase in GDP (as seen Figure 3), but also due to the steady decrease in military expenditures (as seen Figure 4). These double effects caused a greater decrease in the relative number. However, this explanation is not valid for the year 2006. Although military expenditure in real numbers increased in year 2006, the decrease in the defense burden ratio continued due to a relatively higher effect of GDP growth in that year.

2.   Turkish Defense Sources and Allocation

Sources of funds to meet Turkish military expenditures include the Ministry of National Defense budget, the Turkish Defense Industry Fund, the income from the Turkish Armed Forces Foundation, income derived from the sale of surplus equipment, services, or other goods earmarked for the Ministry of Defense, and funds allocated by the Undersecretary for Treasury for loan payments, the General Command of Gendarmerie budget and the Coast Guard Command budget.

Defense budgets are prepared in accordance with the State Planning Organization and the Ministry of Finance structures and are subject to approval by the General Assembly of the Turkish Grand National Assembly. The Ministry of Finance supervises payments and contracts, and defense expenditures are subject to Ministry of Finance audits at the end of each fiscal year.

The portion of the Turkish Ministry of National Defense budget in the GNP is about 3.6 percent on average, and around 12 percent in the Consolidated Budget ("U.S. Bureau of Industry and Security," 2008). About half of the defense budget is allocated to the Land Forces Command with the other half divided among the Turkish General Staff, Ministry of National Defense, Naval Forces Command, and Air Forces Command. The budget does not however include extra-budgetary figures like Under-Secretariat for the Defense Industry (SSM) Support Fund (Sarıibrahimoğlu, 2007).

The Turkish Armed Forces Foundation (TAFF) was created to develop the Turkish defense industry by providing continuous financial support for future investments in the sector. The major source of income for the fund consists of revenues derived from taxes on the sale of alcoholic beverages and tobacco products, along with taxes on the national lottery, joint gambling, and games of luck.

3. Current Situation in Turkish Defense Expenditures

Turkey's military procurement consists almost exclusively of imports. The majority of weapons, including advanced systems, are imported from the major arms producers. According to the Stockholm International Peace Research Institute (SIPRI) database, Turkey was one of the world's fifteen major military spenders in 2006. Also, Turkey had the second largest defense budget (after Saudi Arabia) in the Middle East ("Middle East politics," 2007).

A steady decrease in military expenditures in real numbers since the year 2002 seems to have shifted to an increase after the year 2005. Although Turkey reduced its defense budget in recent years due to economic restraints, on December 11, 2007, Turkey's parliament approved a 1.7% increase for the Ministry of Defense budget for fiscal year 2008. Based on Ministry of Defense budget forecasts for 2009 and 2010,

planners expect a 2-3% increase in military budgets above the inflation rate, which is estimated to be around 10% each year. These percentages, however, do not reflect the extra-budgetary resources to be earmarked for defense in the coming two years (Sarıibrahimoğlu, 2007).

The Turkish Republic's defense policy, since its foundation, has been guided by Ataturk's proverb of "peace at home, peace in the world" ("Turkey's Defense Policy," 2007). However, sustaining peace dependent upon a credible military has required more defense expenditures for Turkey. Defense Secretary Vecdi Gönül declared that contrary to European countries which decreased their defense burden under 1.5 percent, it is impossible to decrease defense spending in the case of Turkey due to its geo-strategic position ("Türkiye Savunma," 2007). Looking at the military expenditure level of Turkey's immediate environment (see Table 1 in Chapter II) and the factors that will be explained in remaining part of this chapter will justify Turkey's high-level military expenditures.

B. STRATEGIC FACTORS

It is a cliché to say that Turkey is a cultural and geographical bridge between the East and West. Historical, religious, ethnic, economic, and political cooperation make Turkey a Mediterranean, Middle Eastern, Eastern European, Caucasian and Black Sea country.

Bağcı and Bal (2004) argue that Turkey's environment was more stable during the Cold War era as the Cold War has frozen the map to a large extent in the region as well as the globe. Central Asia and Caucasus was under the USSR control. The Balkans was also stable under Tito's rule and the Cold War discipline. They acknowledge that in spite of the Iran-Iraq war and Arab-Israeli wars, the Cold War also froze some other problems in Middle East. With the end of the Cold War, all the regions around Turkey have been destabilized. Religious and ethnic irredentism have found a suitable ground to expand, which as led to the emergence of problems in the Balkans, Caucasus, and the Middle East. This has caused new tensions for Turkey (Bağcı & Bal, 2004), while letting Turkey find itself as a "pivotal state" in this new environment (Chase et al., 1996). In contrast to

the general decrease in defense expenditures in some parts of the world after the collapse of the Soviet Union, Turkey's defense spending kept increasing because of the instability and uncertainty in its region.

Turkey was an important country for the West during the Cold War with its proximity to the USSR as a NATO member. Following the collapse of the Soviet Union, Turkey's importance for the West seemed to decline. However, the level of threat for Turkey in this new environment put it in a more vulnerable situation.

Events following the 9/11 attack and 'war on terror' further increased regional tension while underlining the importance of Turkey. Bağcı and Bal (2004, p. 127) state that ethnic and radical conflict around Turkey following the 9/11 attack in the Balkans, Caucasus, and the Middle East can be regarded as potential grounds that may grow into a threat to the U.S. and its allies.

The consequences based off of the end of the Cold War and the 9/11 attack shape the security environment of Turkey today. International relations, strategic notions, and the concept of threat have changed to a great extent. In addition to continuing conventional threats of regional and ethnic wars, non-conventional threats of terrorism and its sources of funding, namely drug trafficking and smuggling, have emerged as new risks and threats. Moreover, security is necessary for sustainable economic development, even though it has been more difficult to manage that security due to complexity and instability of the contemporary environment. Due to its geo-strategic position, Turkey's policy of deterrence in pursuit of regional stability means the Turkish Government has maintained a high level of defense spending regardless of economic performance.

General Hilmi Özkök, the 24th Commander of the Turkish Armed Forces, stated the new requirements of the Turkish Armed Forces in his speech on April 20, 2005, at the Turkish War Colleges as follows: an "asymmetric threat", which has emerged as a result of international terrorism, revealed that today's technology is unable to prevent current threats and risks that are more unpredictable than in the past. Moreover, the post-Cold War era forced NATO to start a transformation process for its force and command structure. A reduction in force size and headquarters along with an increase in

effectiveness and efficiency are targeted. General Hilmi Özkök acknowledged that in parallel with the recent changes, the Turkish Armed Forces continue to renew and develop to reach the target of highly mobile, modular, and flexible new forces with high sustainability, and with the superiority of technology information and training. Forces of the 21st century can then fulfill their function perfectly in any environment. He also stated that in this scope, most of the divisions and regiments were liquidated and converted into brigades and battalions. Upon reducing the military service period on July 15, 2003, the number of soldiers in the Army was reduced by 17 percent and border units were reduced by 15 percent after the organizational structure of the border units were reviewed. He also noted that on the date of the speech, personnel reductions totaled 150,000 and an additional program to reduce the number of border units by 11 percent would continue. General Yaşar Büyükanıt, the current and 25th Commander of the Turkish Armed Forces, has also pointed out that the size of the Turkish Armed Forces will be decreased by 30 percent in 2014 (Şafak, 2006).

C.   PKK TERRORISM

The Kurdistan Workers' Party (PKK) is an armed terrorist organization which was placed on the list of Foreign Terrorist Organizations established by the U.S. Government, on the United Kingdom's list of Proscribed Groups Concerned in Terrorism, and on the list of the European Union illegal terrorist entities. Conflict with the PKK has exacted a high financial drain on the national treasury. Consequently, defense spending has been one of the major components of the Turkish government expenditures.

Contrary to media reports, the PKK's ambition is not regional autonomy in Turkey. The PKK seeks to create an independent, communist, and ethnically pure Kurdish state in an area that it calls Kurdistan on territory currently under the sovereignty of Turkey, Syria, Iraq and Iran. The chief target of the PKK's terrorism, however, has been Turkey. The PKK is funded by extortion, drug trafficking (particularly heroin) and the smuggling of illegal immigrants into Europe, and the smuggling of petroleum products out of Iraq into Turkey (Curtis & Karacan, 2002, p. 18).

1.   Background and Current Situation

PKK began its campaign of armed violence in 1984 which has resulted in some tens of thousands casualties. It employs force and the threat of force against civilian and military targets to achieve its political goals. PKK's targets and activities, for the time duration between 1980 and 1995, are described as follows by the Turkish Ministry of Foreign Affairs:

Although the PKK's primary targets have included military, economic, and social assets in Turkey, PKK activities have included attacks on civilians and diplomatic facilities, extortion, arms smuggling, and drug tracking. The PKK has pursed a wide range of targets and instruments in order to facilitate its terrorist campaign. These include attacking Turkey's tourism industry, economic infrastructure, educational Institutions, and teachers in southeast Turkey; using cyanide to poison military drinking water supplies; and engaging in unconventional tactics, ranging from assassination to drive-by shootings, burning villages and forests, and executing uncooperative civilians.

By the late 1980s, violent incidents by the PKK increased to 258 in the first six months of 1989 from 315 for the entire year of 1988. ["Extraordinary Situation" (OHAL) had been declared in the southeast of the country in 1987. Under OHAL, security was the responsibility of the police and gendarmerie under local governors and the Ministry of the Interior. The regular military was completely excluded from the command structure.] By mid-1995, incidents sharply increased when Turkish officials estimated that about 15,000 civilian and military personnel had been killed by PKK violence. Finally, the Turkish government estimates that the conflict with the PKK has exacted a high financial drain on the national treasury. The government estimates that conflict with the PKK costs about $10 billion per year. This is particularly significant in light of the fact that Turkey is expected to maintain a budget deficit of about $5 billion for 1995. The PKK had a detrimental effect on Turkish tourism in 1994 causing a $700 million decrease in revenue from the previous year. It is estimated that this amount is tantamount to a 50 percent reduction in Turkey's expected tourism income in 1994. The PKK also targets investment projects under development in the southeastern region of Turkey. The PKK has also been conducting attacks on teachers and schools in southeastern Turkey. From 1984 to 1994, over 217 school teachers were abducted and murdered by the PKK in southeast Turkey. By the end of 1993, about 700 schools had to be closed because of brutal

killings of teachers and burning of the school buildings. Overall, 3,600 schools were closed in the region, leaving nearly an estimated 100,000 children uneducated ("The Workers' Party," 2008).

The group's scope of terrorist operations has been significantly reduced after the arrest of its leader, Abdullah Öcalan, in Kenya in 1999 (Curtis & Karacan, 2002, p. 18). The PKK declared a unilateral ceasefire in that year and changed its name to Kurdistan Freedom and Democracy Congress (KADEK) and then to Kongra-Gel (KGK), although the PKK acronym is still used by parts of the movement since it was founded in 1974 ("Terrorism Act 2006," 2008). It was clear that this change was aimed to protect itself from the legal implications of being listed as a terrorist organization.

After August 2000, aside from a few isolated incidents, the armed conflict had come to a complete halt. Even so, every time the PKK finds a safe haven, it renews violence. However, since 2004, there has been an increase in PKK attacks on the Turkish military, police, and governmental targets near the Iraqi border. During the 2003-2005 period, the total security personnel lost (203 soldiers, 21 police officers, and 22 village guards) was 246. The total number of personnel wounded and disabled was 147. The total armed militants captured were 1325 (359 dead, 377 live, 589 amnesties). The TBMM (Grand Assembly of Turkish Republic) report mentions growing efforts in mobilizing the criminal intelligence exchange.

The very latest improvements are discussed below. The PKK declared second ceasefire since September 28, 2006. However, Turkish Prime Minister Recep Tayyip Erdoğan and Chief of Staff General Yaşar Büyükanıt did not recognize such a motion. Erdoğan was quoted as saying; "A ceasefire is done between states. It is not something for a terrorist organization," ("Turkish army rejects", 2006; "Turkish PM rejects," 2006). The Turkish army called for action against PKK training camps in Northern Iraq. Turkey has also offered an olive branch to the PKK. Amnesty has been offered to PKK members who have not been involved in attacks. On December 9, 2006, P.M. Recep Tayyip Erdoğan announced he would propose legislation broadening the amnesty's reach (Fein, 2008).

On September 29, 2007, PKK terrorists set up an ambush in the Beytüşşebap district of Şırnak. PKK used machine-gun fire on a minibus carrying 13 people. The assault claimed the lives of seven village guards, five construction workers, and one young child, while wounding two others ("Terrorists target," 2007). In early October 2007, PKK terrorists carried out another ambush, this time near the border with Iraq, killing 13 Turkish soldiers. The incident sparked renewed threats from the Turkish Government to cross over into Iraq to pursue the terrorists ("Turkish soldiers," 2007).

Incidents led to the question of whether or not the Turkish military would cross the border into Iraq in order to track down members of the PKK responsible for terrorist attacks in Turkey. On the October 17, 2007, the Turkish Parliament approved a military incursion into Iraq to pursue the PKK terrorists. The vote for incursion in the pursuit of PKK terrorists for a one-year period won with an overwhelming 507 to 19 by the Turkish Grand Assembly ("Turkey approves," 2007). By mid-2007 around 3,500 PKK militants were believed to be based in Iraq ("Kongra-Gel," 2008). Action was delayed on a request by the U.S. government on the condition that "swift steps" were already taken to deal with the rebels. Just five days later on October 22, 2007, another PKK ambush left 17 more Turkish soldiers dead and some were taken prisoners ("Turkish troop," 2007). Turkey reported that 32 terrorists were also killed in the raid ("Turks mull," 2007).

The Turkish General Staff declared on its official webpage that total armed militants captured during year 2007 was 653 (315 dead, 229 live, 109 amnesties). Overall, total terrorist captured with the Northern Iraq operations increased to more than 800 during the year 2007.

Although the 9/11 attack and the subsequent global war on terror (GWOT) further increased regional tension, the aftermath of the 9/11 attack was an opportunity for Turkey. The GWOT sustained a general acceptance towards the Turkish view of the threat from terrorist activities and the need for international cooperation to fight against terrorism. Turkish P.M. Recep Tayyip Erdoğan met with U.S. President George W. Bush at the White House on November 5, 2007, to ask for U.S. support in the fight against the terrorist group PKK. Bush told Erdoğan that he was committed to countering the terrorists and offered to share real-time intelligence with Ankara (Saygun, 2007). The

Turkish Government handed over authority to the Turkish Armed Forces (TSK) on November 28, 2007, to carry out a military incursion into Northern Iraq. Following that, On December 16, 2007, the Turkish Armed Forces started a large-scale cross-border attack on PKK camps situated in Northern Iraq at Kandil with Zap, Avaşin and Hakurk camps ("US backed," 2007). The TSK announced on its webpage that there were no civilian casualties in the Turkish operations against PKK targets. Ground operations in Northern Iraq were the result of effective and successful military action and diplomatic efforts. All operations were supported internationally (Turkone, 2007). The United States designated the PKK-affiliated terrorist organization Kurdistan Freedom Falcons (TAK) as a Specially Designated Global Terrorist Organization on January 10, 2008. With this designation, the United States reaffirms its commitment to fight terrorism in cooperation with its NATO ally, Turkey. The United States will continue to work with Turkey, Iraq, and the rest of Europe against the PKK and its support networks and affiliates, such as the TAK ("US Department of State," 2008).

On February 21, 2008, the TSK initiated a new cross-border operation of targets on PKK bases in the Zap area in Northern Iraq which lasted eight days. The Chief of the Turkish General Staff, General Yaşar Büyükanıt, stated that the Turkish ground operations against the PKK achieved their objectives: "We needed to give them a lesson and we did. We have other lessons to give. Other operations will be conducted as necessary. This was just a phase in the fight against terrorism" ("More attacks on PKK," 2008). This statement indicates that the TSK will continue its determination on the fight against terrorism for the year 2008.

2. PKK and Prevention of Terrorism as an Economic Burden

Turkey employed a stubborn, and at times, harsh policy based predominantly on military power first to stop the terror activities conducted by the PKK and then terminate the terrorist groups and their support bases. Turkish officials estimated that more than 35,000 civilian and military personnel had been killed by PKK violence. Numerous Turkish incursions into Northern Iraq took place, some of which were made by huge

military power including thousands of soldiers supported by tanks, artilleries, helicopters and Air Force jets. The prevention of terrorism results in a relatively quite significant cost for the Turkish economy.

Defense spending in Turkey is directly correlated with the PKK conflict. A decrease in defense spending from 2000 until 2005 (Table 3) could be explained partly by the decrease in armed conflict with the PKK. Also, the increase in defense spending after 2005 may be explained in this context. Abdulkadir Aksu, the Turkish Minister of Internal Affairs, declared that Turkey spent $100 billion for the prevention of terrorism up until end of year 2006. Terror creates an extra burden of about $6 billion per year to the Turkish economy ("Terör faturası," 2006). When the socio-cultural and cultural externalities are added to this number, the overall cost of terror to the Turkish economy becomes bigger. The report prepared by Turkish economist Mustafa Sönmez made public that Turkey earmarked one-third of its 2006 fiscal budget for the eastern and southeastern regions where Turkey had been experiencing terror problems (as cited in Sarıibrahimoğlu, 2007).

The Turkish Development Bank reports that Turkey invested $429.6 billion for the East Anatolian (DAP) and South Anatolian Project (a.k.a. GAP) until the year 2003. However, the Turkish economy could not achieve the expected return from these projects because of the PKK's terrorist activities within these regions. The opportunity cost of spent money for the prevention of terror in Turkey would accomplish 10 GAP projects or would pay the oil need of Turkey for 32 years. It is also equal to the total tourism receipts of Turkey for 13 years and the total cost of its export revenue for 3 years (Gündüzalp, 2007).

Although there was a significant decrease in the defense budget in the beginning of the year 2007 with the economizing measures ("Türkiye'nin savunma bütçesi," 2007), recent increase in conflicts with PKK required a YTL5.1 billion increase in the Turkish Defense Ministry budget immediately with then reached almost YTL18.2 billion for the year 2007 ("Savunma harcamaları tırmandı," 2007). The overall burden of terror on the Turkish economy, which is the total of the Defense Ministry budget plus the Gendarmerie Headquarter budget, for the year 2007 reached YTL22.4 billion (Uras, 2007). Therefore,

the defense budget became the biggest expenditure again among the governmental expenditures after three years by passing education expenditures (Güngör, 2007). Since the Turkish Armed Forces (TSK) is intended to root out the terrorist groups within and around Turkey, forecasting an increase in defense spending in year 2008 is feasible.

3. Increased Defense Spending due to Terrorism and Its Effect on Economic Growth

Defense spending has been one of the major components of the Turkish Government's expenditures. Conflict with the PKK has exacted significant costs. As was previously explained, conflict with terror has been causing detrimental effects on various areas, ranging from the tourism industry to economic infrastructure and educational institutions of the Turkish Republic. The question of 'if Turkey did not experience such a terror, would her economy be better today?' is hard to answer. Although defense spending seems detrimental to economic growth at first sight, the defense-growth relationship may change depending on various factors as explained in Chapter IV of this thesis.

Sezgin (2003) asserts that an increase in the military personnel population as well as 'village guardians' (i.e., köy korucuları) in the Southeastern Anatolian Region increases the income level and spending capacity of the region. An increase in the waged population increases the total demand.[16] Consequently, the average per capita income differential among the regions decreased. Existence of the Turkish Armed Forces in this region provides positive externalities in the education and health areas. In addition to that, this lengthy existence accelerates infrastructural investments which are also used by civilians. The long time armed conflict with terrorism associated with PKK has made the Turkish Armed Forces more dynamic. Sezgin (2003) also claims that this better dynamism was interpreted as a loss of competitiveness against the Turkish Armed Forces by the Greece. Hence, Greece tried to first find new alliances against the Turkey, and then later, new ways of working together with Turkey in place of conflicting. He claims

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[16] Village guardians' wages and other compensations are paid out of the Ministry of Interior affair budget. It is hard to include these expenditures in the military expenditures due to unavailability of detailed data (Gülük-Şenesen, 2001, p. 390).

that Greece's look on the EU issues that favor Turkey can be interpreted as consequences of this context. Moreover, the defense industry has broken through. Defense R&D is seen as a means of promoting a high technology sector. The grown defense industry increased the investment besides technology. The civilian sector also received the benefits of the technology spillover.

D.   DISPUTES BETWEEN TURKEY AND GREECE

Scholars agree that Greece and Turkey enjoyed a period of friendship under Turkish President Ataturk and Greek Premier Venizelos (Brauer, 2002) following the Peace Treaty of Lausanne in 1923 and subsequently the Treaty of Friendship (i.e., the Ankara agreement) in 1930. Both countries became allies in the Balkan Pact with Romania and Yugoslavia in 1934 following the aftermath of the First World War. It is also worth noting that Venizelos nominated Ataturk for the Nobel Peace Prize in 1934. This friendship continued well during the early Cold War as both countries continued as allies in 1952 as members of North Atlantic Treaty Organization (NATO). There has been continuous tension after 1955 beginning with the Cyprus dispute. In 1959, with the agreement of Greece, Turkey and the United Kingdom, a constitution was introduced giving Cyprus independence with power shared between a Greek Cypriot president and a Turkish vice-president. This political structure caused a serious crisis in 1964 and again in 1974 (Bozkurt, 1999). In 1963, constitutional amendments proposed by the President of Cyprus, Archbishop Makarious, caused violence between the two sides (White, 1993, p. 241 as cited in Bozkurt, 1999). "Greek extremists who wanted enosis (union with Greece) launched a series of attacks on Turkish Cypriots, killing some and taking others hostage" (Cooper & Berdal, 1993, p. 118). "Despite the deployment of UN peacekeepers in 1964, sporadic inter-communal violence continued forcing most Turkish Cypriots into enclaves throughout the island. In 1974, a Greek Government-sponsored attempt to seize control of Cyprus was met by intervention from Turkey" (The World Factbook-Cyprus, 2007). The relationship deteriorated and reached its lowest point following the Turkish intervention in Cyprus to prevent the enosis of Greek Cypriots with Greece under the coup regime of Nikos Sampson.

From the 1970s and onwards, besides the Cyprus problem there have been disputes over the boundary of territorial waters in Aegean, airspace, continental shelf rights, and Greek militarization of certain Aegean islands. There has been cycles of improvement and worsening of bilateral relations with the long-standing disputes and new rapprochements. The Kardak crises (25 December 1995 and 31 January 1996) nearly brought the two countries to war. Relations between Greek officials and PKK terrorist group leader Abdullah Öcalan, as well as the role of the Greek Embassy in Nairobi International Airport in Kenya when Öcalan was captured in an operation by MİT (Turkish National Intelligence Organization), caused a crisis in relations between the two countries for a period of time ("How Turkey got," 1999). In August 1999, Turkey suffered from a devastating Marmara earthquake that killed thousands of people. In September 1999, Greece was also hit by an earthquake. Peoples' sympathetic response to the disastrous earthquakes by sending condolences and rescue teams created an "earthquake diplomacy" that changed the bilateral relations by reducing hostility among the nations (Gündoğdu, 2001).

This "earthquake diplomacy" developed into a political dialogue toward détente between the states which may be implemented as one of the cycles of improvement. During the mutual visits of each Foreign Minister (Mr. G. Papandreou to Ankara (January 2000) and then the Turkish counterpart, Mr. Ismail Cem, to Athens (February 2000)), nine agreements were signed on different areas such as tourism, cultural and economic cooperation, combating against crime and terrorism, and so on to start a conflict solution ("Bilateral relations," 2008). Foreign Ministers of the two countries agreed to take up and implement a set of "confidence building measures" in their following meeting on December 2000 ("Bilateral relations," 2008). In 2004, Turkey reconfirmed a casus belli if Greece expanded its territorial waters to 12nm. In April 2005, Greece and Turkey agreed to establish a direct telephone line between the headquarters of the Air Forces of the two countries to inform about military exercises to reduce the tension caused by air space violations over the Aegean Sea ("Kırmızı telefon," 2006).

Cycles of improvement and worsening continued as Jerkins (2007) claimed: "although the recent improvement in ties has undoubtedly considerably reduced the possibility of the two countries going to war, deeply ingrained suspicions and prejudices are proving harder to erase"[17]. General Hilmi Özkök showed an example about suspicion and prejudice in his speech at the Turkish War College as follows;

> After the 'Government Foreign Affairs and Defense Council meeting, which is held on the first week of March of each year in Greece to determine the defense policy of the country, it is stated that although there have been positive developments between the two countries, Turkey's political demands on Greece's rights of sovereignty have not changed and therefore Greece has to maintain the required deterring and reliable force.

> Moreover, during the take-over ceremony of Greece Armed Forces (Chief of the General Staff), Turkey was referred to as a threat and the following statement was made: 'Contrary to international justice and the foundations of international agreements, threats and unlawful demands made by our eastern neighbor constitute her basically unlawful approach'.

1.   Effects of the Disputes on Military Expenditures

Based on these conflicts and the high defense burden of both countries, there has been a considerable amount of research to reveal the existence of a possible arm race between the two countries (also see Chapter III). Although no strong evidence has been found (Brauer, 2002; Öcal, 2002), it was stated that defense allocations were strongly influenced by each other's military spending (Kollias & Paleologou, 2002; Sezgin & Yildirim, 2002). In some certain times, bilateral relations directly affected the defense expenditures of each country.

Turkish and Greek defense spending followed a downward trend up to 1974. The defense behavior of both countries largely changed in the post-1974 period with sharp

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[17] "The Turkish General Staff (TGS) maintains a running log of alleged violations by Greek planes and ships on its website. On October 5, 2007, the TGS bitterly denounced Greece for its alleged failure to abide by the terms of the bilateral agreements to cooperate against trafficking in illegal migrants. It even posted a scorecard of what it claimed was the increasing number of illegal migrants being dumped by the Greek authorities in Turkish territorial waters, including 3,047 in the first ten months of 2007 alone (www.tsk.mil.tr)" (Jerkins, 2007).

increases in their defense shares (Georgiou et al., 1996). Georgiou et al. (1996) stated that Turkish and Greek defense shares increased from 3.9 to 5.9 percent and 4.2 to 6.8 percent in 1974, respectively.

The Turkish and Greek defense expenditure during the following period of 1985-1999 is summarized by Kollias and Paleologou (2002) as follows:

> In comparative terms both countries have allocated a greater share of their national income to defense. For example, during 1985–98 Greece on average allocated 5.4 percent of GDP to defense while Turkey allocated 4.2 percent. Both shares are appreciably higher than the EU and NATO averages for the same period which were 2.6 percent and 3.1 percent, respectively. Furthermore, in the post Cold War period, while most countries have reduced their defense budgets, Greece and Turkey have in real terms increased their military spending. During 1989–99 total defense spending by NATO declined in real terms by about 24 percent. Similarly, total E.U. defense expenditure fell by approximately 11 percent. However, as SIPRI data show, Greek and Turkish military spending increased in real terms by 30 percent and 110 percent, respectively.

FIGURE 5 Turkish vs Greek Defense Burden 1988-2005
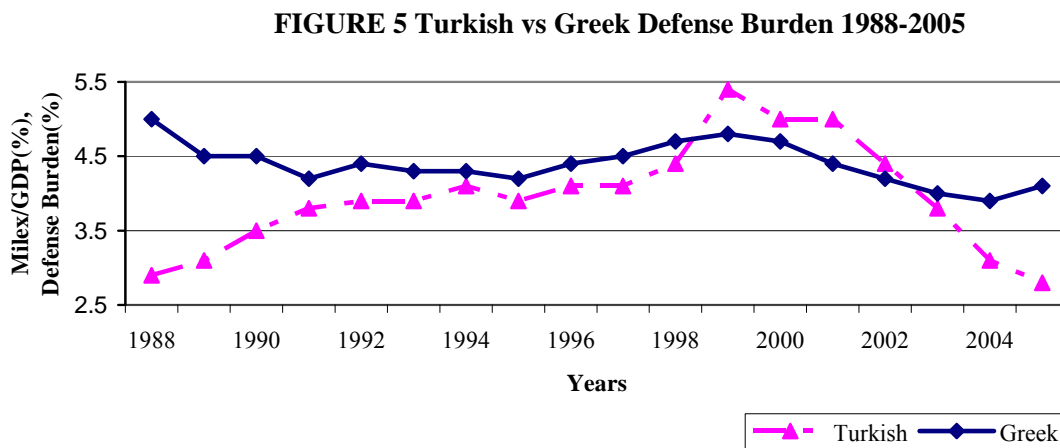

Data Source: SIPRI

Figure 5.   Turkish Versus Greek Defense Burden 1988-2005

Figure 5 plots Greek and Turkish military expenditure as a percentage of GDP (i.e., defense burden ratio) for the period 1988-2005. Some portion of the change in defense burden of each country can be explained by the bilateral relation perspective. For

example, following mutual visits from each Foreign Minister and a set of agreements signed for "confidence building measures" between the year 2000 and 2001, "Athens announced a plan to reduce its armed expenditures along with reducing its armed forces from 140,000 to 80,000-90,000 men. Turkey also responded to this gesture by postponing defense planning measures" (Zilidis, 2004, p. 88).

On the other hand, a relatively higher defense burden ratio after the year 2003 for Greece as seen in Figure 5 draws attention. Greece continues to arm the islands while claiming its "justness" over the long-standing disputes. When all these are assessed it is seen that Greece continues to base its National Defense Policy on the assumption that the threat comes from the East.

E.   MILITARY MODERNIZATION PROGRAM

Turkey's geo-strategic importance, hence its foreign policy, requires strong and mobile armed forces which are also required for increased firepower. Being equipped with modern and advanced weapons is needed not only for security concerns but also for being a reliable ally in international peacekeeping efforts. In Turkey's perspective, ensuring the effective deterrence during peace times and rapid intervention in times of crises may have been maintained by continued efforts of upgrading and modernizing of military power.

Turkey officially announced a military modernization program in 1996 that mainly consisted of procuring high technology equipment and upgrading older systems, which was expected to total $150 billion within 30 years (Valasek, 1999). A further revision of a 10-year $20 billion bill was included in early 2000 to overcome the bottleneck in the modernization plan (Günlük-Şenesen & Sezgin, 2003). This plan made Turkey one of the most active buyers of weapons in the world after the post-Cold War era.

Hen-Tov (2004) states that military modernization is expected to bring forth several consequences. The emergence of Turkey as a major buyer has profound effects on the political economy of western weapons supplier states. The military modernization program helps to build a substantial Turkish military industry to further augment its

deterrence. Almost all procurement plans include investment offsets, explicit co-production with Turkish firms, or alternative means of technology transfer. Moreover, training with the most up-to-date equipment and earning international respect from other NATO countries will ensure strengthen the military's domestic image of professionalism. Moreover, potential military contracts are used for political purposes such as gaining support from Germany and other EU states for Turkey's EU candidacy.[18]

The objective of raising the Turkish defense industry during the modernization stage seems to have been managed. Along with the state, the private sector is playing a major role in making Turkey's defense industry more competitive and developed. There has been rapid expansion among a growing number of defense manufacturing subcontractors. The U.S. Bureau of Industry and Security Report (2003) on Turkey indicated that 21 percent of the needs of the Turkish Armed Forces were met by domestic production for the main weapons, equipment and spare parts, while the remaining 79 percent was supplied from abroad. Strategic Plan 2007-2011 (2007) of the Under-Secretariat of Defense Industries (SSM) of Turkey, namely the procurement authority leading the Turkish defense industry, indicates that their goal is to increase the average portion to meet the system requirements though local infrastructure currently at 25 percent to 50 percent through the year 2010. Strategic Plan 2007-2011 states that concurrently, Turkey would increase exports of defense products and services to around $1 billion per year by 2011, up from the current $200-300 million per year. The SSM target for defense exports is $1.8 billion between 2006 and 2016. SSM has already earmarked around $1 billion for research and development (R&D) programs.

It is clear that the military modernization program requires money transfers which would lower the well being of society due to possible negative welfare tradeoff. However, if Turkey manages to reach its aim of focusing on the projects to be locally

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[18] Other examples are as follows (Valasek, 1999); "in June 1998, Turkey suspended arms talks with France in protest to the passage in the French National Assembly of a bill recognizing the 1915 events as if Armenian genocide. Similarly, in 1998, the Italian company Agusta SpA was briefly scratched from the list of contenders for Turkey's order of 145 attack helicopters after the Rome government gave shelter to Kurdish leader Abdullah Öcalan. One of the bilateral relationships most obviously affected by the modernization program is Turkey's strategic partnership with Israel, whose cornerstone has been industrial defense cooperation."
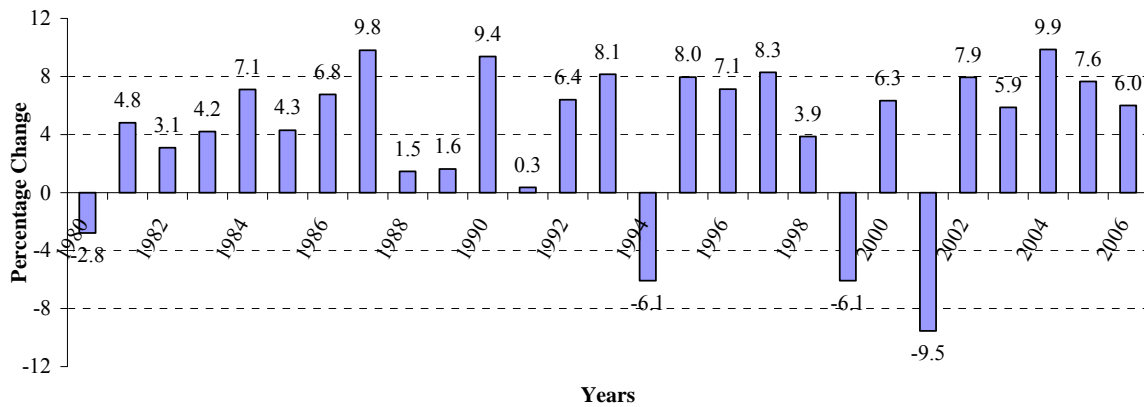
produced and those could be sold in the world markets, the modernization program may have a positive effect on economic growth in the sense of spinoff and spillover as well as an external balance term while increasing deterrence and creating a safe environment.

F.   ECONOMIC ENVIRONMENT

Turkey's economy is composed of modern industry and commerce along with a traditional agricultural sector that still accounts for more than 35 percent of employment in the country. Both a capable workforce and diverse natural resources are the advantages in addition to its proximity to global markets due to its strategic geographic position among Asia, Europe and the Middle East (Turkey Country Overview-WorldWatch, 2008, p. 87). Turkey's easy access to strategically important regions and major energy sources enables it to reach a diverse market and facilitate potential for economic growth.

Turkey experienced rapid economic growth following the economic liberalization which began in the early 1980s because of a large increase in tax revenues. Rapid increase in economic growth led the military to carry out the modernization plan. While military expenditures jumped an average 12 percent from 1989-99 in absolute terms, military expenditures as a percentage of overall government expenditures fell from 18.4 percent to 13.9 percent (U.S. Department of State, WMEAT, 2000 as cited in Hen-Tov, 2004). This "fiscal windfall" prepared an environment for the Turkish military to urge for a full-scale military modernization (Hen-Tov, 2004).

FIGURE 6 GNP Percentage Change at 1987 Prices 1980-2006

Data Source: TURKSTAT, SPO
GNP data for the year 2006 is taken from Ministry of Finance database

Figure 6.   GNP Percentage Change at 1987 Prices 1980-2006

However, economic growth following the liberalization program did not continue for a long time. Turkey experienced high interest and inflation rates, volatile growth rates, high unemployment rates, and high fiscal deficits during its economical liberalization and privatization history. Coalition governments were incapable of making hard economic decisions and sticking to them during the 1990s. The economic situation was affected by the recession in Europe, the custom union with the EU, and unstable growth rates. A decade of economic mismanagement during the 1990s resulted in a rising current account deficit by late 2000. Even after Turkey undertook several disinflation and stabilization programs arrangements with the IMF, Turkey's economy could not escape from suffering a series of banking and economic crises in 2001. The disinflation and stabilization program which was prepared and carried out under IMF supervision started in Turkey on January 1, 2000, collapsed in February 2001. The program was launched to reduce the high inflation rates that Turkey had been in trouble with for a long time. The consequences of the collapse were damaging for the Turkish economy. It was the biggest economic crisis in the economic history of Turkey, whose burden was carried by the Turkish public.

During the years of economic crises there had been huge accelerations on entries in and exits from the Turkish market by foreign investors because of the fragility of the financial system and potential risk. There were extraordinary interest rates. For instance, on November 30, 2000, the Central Bank reversed its policy and announced that "it would no longer fund the commercial banks in the interbank market and this announcement skyrocketed (over 1000%) the overnight interest rates to four-digit levels" (Ardic et al., 2007). Political crises turned into economic crises at some certain times. For example, on February 19, 2001, a political crisis between the Prime Minister and the President seriously hit the markets. "Over-night interest rate rose abruptly up to 2000% on the 20th of February, and to 4000% on the next day. Rising interest rates, with overnight rates reaching 5000%, could not stop the rapid flight from the TL. Within two days shares on the Istanbul stock exchange had fallen by 63%. Foreign investors pulled $5 billion out of Turkey on 19 February alone" (Satıroğlu, 2001).

Failure in privatization and banking reforms led to the collapse of confidence in Turkey. Political uncertainty caused loss of confidence in both internal and external environments. Failure of the government to fully implement the program was the main reason for the crises from the IMF perspective. Nevertheless, the main reason of the crises was different from the Turkish perspective. Some scholars blamed the program itself as the main reason of the crisis, as Turkey's infrastructure was not ready for transformation and it did not experience fiscal discipline in the past. Thus, the weak economic situation combined with an incorrect economic program led to crises (Erçel, 1999).

Turkey (and also Greece) is a leading recipient of U.S. arms. The U.S. used to provide the Turkish government with grants and loans to finance the purchase of new American weapons but was stopped by the U.S. Congress in 1998 because of an assessment that Turkey then possessed sufficient funds to finance its arms purchases. It is also important to note that, despite demands for tight fiscal and monetary control and economic vigilance of the IMF to reduce the high inflation, the Turkish Government continued to keep high levels of defense spending during the twin crises in 1999 and 2001 as was seen in Figure 2.

Although Turkey's economy suffered from a series of banking and economic crises in 2001 as well as a deep economic downturn and increase in unemployment under the coalition governments with weak economic policies, Turkey's economy has recovered strongly since then. Following the crises, the government agreed to tighten economic policy, which improved macroeconomic performance, and accelerated the performance of the banking system. Its economy grew an average of 7.5% per year from 2002 through 2006, which was one of the highest sustained rates of growth in the world. A CIA report summarized the post-crises Turkish economic overview as follows;

The economy is turning around with the implementation of economic reforms, and 2004 GDP growth reached 9%, followed by roughly 5% annual growth from 2005-06. Inflation fell to 7.7% in 2005 - a 30-year low but climbed back to 9.8% in 2006. Despite the strong economic gains from 2002-06, which were largely due to renewed investor interest in emerging markets, IMF backing, and tighter fiscal policy, the economy is still burdened by a high current account deficit and high debt. Prior to 2005, foreign direct investment (FDI) in Turkey averaged less than $1 billion annually, but further economic and judicial reforms and prospective EU membership are expected to boost FDI. Privatization sales are currently approaching $21 billion (The World Factbook-Turkey, 2007).

Worldwatch's economic overview of Turkey (2008, pp. 87-88) reports that "Turkey's current account has been in deficit in recent years owing to its large deficit in the merchandise trade balance, although it runs surpluses in the services and the transfers balances." The report continues by stating that "the current account deficit has continued to widen, to 7.9 percent of GDP in 2006 from 6.3 percent of GDP in 2005, due to strong growth in imports driven by consumer demand. Nevertheless, increased FDI led to a buildup of gross international reserves, which increased to US$54.5 billion in 2006 from US$52.2 billion in 2005."

According to Kemal Unakıtan, the Minister of Finance of Turkey, the growth rate would probably become 5.5 percent of GDP and reaching 716.6 billion liras in 2008, up from 575.8 billion liras in 2007. According to the balance of payments report of the

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Central Bank, the current account deficit is expected to be 36.4 billion USD at the end of year 2008, while it was 29.6 billion USD in January-October 2007 and 26.7 billion USD in 2006 ("Government unveils 2008," 2007).

G.   OTHER FACTORS

In addition to the factors analyzed above, there are several more factors for Turkey that have been causing high-level military expenditures or have the potential to increase military expenditures in the future. Some of those factors are summarized in the following paragraphs.

Internal political factors may also be one of the determinants of the defense expenditures. Since the requirement of strong military power has obtained common acceptance in contrast to most Western countries, the Turkish military modernization program that announced in 1996 has never become the subject of parliamentary debates. In other words, the Turkish military arranged its defense budget and procurement policies within fiscal limits without encountering opposition in parliament (Karaosmanoğlu, 2000).

Another factor may be peace support operations. As a result of the changing new security requirements after the Cold War and 9/11, peace support operations have increased significantly. In parallel with Atatürk's proverb, "peace at home; peace in the world," Turkey participates in 'peace support' and 'war on terror' operations to the greatest extent possible in parallel with its international commitments, national interests, and capabilities (see Appendix C). The Responsibility Sharing Report (2002) stated that Turkey contributed far more than its "fair share" of NATO's military force in all of the following categories: active-duty military personnel, ground combat capability, naval tonnage, and combat aircraft capability.

The Baku-Tbilisi-Ceyhan (BTC)[19] crude oil pipeline which started to pump oil for the first time on May 10, 2005, from Caspian Sea to the Mediterranean Sea created greater geopolitical importance for Turkey since the pipeline is an important leg of the East-West energy corridor. It will require constant guarding to prevent sabotage, although since the entire pipeline is buried it will be difficult to attack. However, energy pipelines which cut across Turkey are too long for complete protection from possible sabotage. The PKK terrorist group has issued big threat towards this pipeline such that security concerns of the pipeline will probably increase the cost of guarding in the future.

Turkey's immediate environment continues to generate big threats. In addition to Iran's aggressive foreign policies, its possible acquisition of nuclear weapons introduces new security challenges for Turkey in the Middle East. "A nuclear-weapons-capable Iran with its important strategic position would pose a great danger to peace and stability in the Middle East. An Iran with the capability of mass destruction would fundamentally alter the balance of power and this situation is not acceptable for Turkey's security" (Arslan, 2007).

There had been years of cold relations due to mutual threat perception with Syria. Although there has been betterment in bilateral relations since signing the Adana Accord in 1998 with neighbor Syria, the two countries came close to war during the capture of terrorist leader Öcalan. Additionally, distribution of the waters of the Euphrates, Tigris and Asi rivers created a water dispute with Syria which has been the major issue between the two countries.

There are many more factors related to historic and future levels of Turkish defense spending, such as EU membership, the Kurdish and Islamist question, civil-military relations, aftermath of the Iraq operation, relations with post-Soviet Turkic countries, Arab states and Israel, the Caucasus countries, and the Balkan countries. These factors were not investigated due to their relatively lower effects on military expenditures.

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[19] The pipeline is named after the following. Baku is the capital of Azerbaijan; Tbilisi is the capital of Georgia; and Ceyhan is a port on the south-eastern Mediterranean coast of Turkey.

VIII. CONCLUSION

This goal of this project was to illuminate the relationship between defense expenditure and economic growth for Turkey by employing a causal multiple regression method that would lead to recommendations for future Turkish policy. Various aspects of the relationship between military expenditures and economic growth were investigated to support the results and implications of the empirical study. The following conclusions highlight the path taken during this research.

Defense economics emerged as a relatively new field of study within the sub-disciplines of economics. The peace dividend, security, and opportunity cost concerns have made defense economic more favorable in parallel to level of conflict among countries. The most recent trend in world military expenditure is a good reason to claim that its importance will continue for the foreseeable future.

There are comprehensive reviews of literature on the defense-growth relationship. Many empirical studies have been published to understand the relationship between defense spending and economic growth for various countries for a range of periods by using an assortment of methods. However, there is still controversy about whether defense expenditures cause a higher or lower growth rate.

There is no clear-cut result for a defense-growth relationship. The vast literature on the economic effects of military expenditure suggests a number of different linkages between defense spending and output. They can be broadly grouped into supply-side effects, demand-side effects, and security effects. The supply-side approach focuses on the opportunity cost of scarce resources and claims that defense spending diverts scarce resources away from more productive uses. This causes a reduction in civilian consumption and lowers the well-being of the society because of the reduction in civilian and public savings and investments. Although supply-side approach suggests an overall adverse affect of defense spending on economic growth, positive spillover effects of defense spending have nonetheless received attention in the literature. On the other hand, Keynesian Theory assumes that idle resources are available in the economy, and

concludes that the net effect of defense expenditures on growth is positive. Another positive side of the military expenditure is a safe environment for members of the society which is crucial for the efficient operation of markets.

Different definitions, price deflators and choice of exchange rate make the international comparison difficult and the available data less reliable. Moreover, only limited data is available for some countries because of the secrecy applications which contribute to a reliability problem on available data. Reliability problems should be taken under consideration before making any prediction or implication by the researchers, since using misleading measures create bias and errors.

Taking account of the difficulties present in previous military expenditure studies, an econometric model was specified and empirically tested using Turkish data for 1969-2004. The results of the growth model supported hypothesized linkages between economic growth and the hypothesized explanatory variables. The positive linkage between investment and economic growth supported the hypothesis that investment is an important determinant of growth. Also, the model showed that the external balance on goods and services has a negative effect on economic growth in Turkey. The findings of study revealed that the effect of military expenditures on growth is negative. Results suggested that there is a negative linkage between military expenditure and economic growth.

The second part of the empirical study tested the defense-welfare relationship for Turkey, using expenditures on health and education as welfare proxies. The empirical findings suggested that there are tradeoffs between military expenditures and welfare spending. However, the tradeoff between military expenditures and either health or education is different. While there is a negative tradeoff between military expenditures and health, the tradeoff is positive for education. These results supported the idea that increased defense expenditures reduce the resources available for health, but do not crowd out education. Health education implies that defense has a priority in the budgeting process over health expenditures. All of the results should be interpreted carefully with data consistency and other problems considered.

The growth model results suggested that reducing military expenditures can be expected in order to increase growth. If more capital resources are used in the civilian economy following defense cutbacks, then this result is plausible. However, both external and internal security concerns make it difficult to decrease defense spending.

Strategic factors such as the conflict with terrorism, disputes with Greece, the economic environment, and military modernization programs are major factors for the level of Turkish military expenditures. Even though there have been fluctuations ranging from better to worse on these issues, predicting a continuing trend in the high level of military expenditures for the future is very plausible. This is because military expenditure is crucial to providing a strong defense which provides deterrence and security in a changing threat and risk environment. The high current account deficit and debt may be problematic for the future economic situation. However, high levels of military expenditures regardless of economic performance were an integral part of Turkey's national security strategy. Indeed, Turkey continues its military modernization plan purposefully. Recent events in the conflict with PKK terrorism show that the prevention of terrorism will likely increase the defense burden in the Turkish economy. Suspicion and prejudice are still valid on bilateral Greek-Turkish relations. Complex relations with neighboring countries increase the unpredictability of regional threats and risks.

The downward trend from 2001 to 2005 in real military expenditure has been reversed. Recent years' budgets and evolution of the regional security environment show that predicting an increase in military expenditure is feasible. This increase is not a waste of money but a key step in managing Turkey's national defense. If Turkey manages to meet the system requirements through local infrastructure in its military modernization program, Turkey may manage to decrease the negative effects of military expenditures on economic growth via a spinoff effect of military expenditures. In that case, spillovers of the domestic defense industry would be more useful for the civilian sector.

The Turkish Republic's defense policy, since its foundation, has been guided by Ataturk's proverb of "peace at home, peace in the world." However, sustaining a peaceful environment has required a high level of military expenditures. Accordingly, the efficient and effective allocation and use of scarce defense resources and budget should be the main objective for the military establishment.

APPENDIX A.   AREAS OF DEFENSE ECONOMICS

Areas of Defense Economics (Hartley, 1993, p. 78)

A. Macroeconomics: Developed and Developing Countries

    1. Determinants of defense spending

    2. Burdens and benefits of expenditures (including trade-offs)

    3. Growth and development

    4. Country studies

B. International Trade: Arms Trade

C. Alliances: International Public Goods

D. Microeconomics: Demand and Supply

    1. Features of defense markets (public goods)

    2. Procurement

    3. Contract types

    4. Defense industries

    5. Research and development

    6. Procurement options (e.g., importing; collaboration)

    7. Regional impacts

    8. Case-studies (industry and project case-studies)

    9. Labor markets

        (a) Employment in defense industries

        (b) Military manpower: recruitment, training, retention

E. Disarmament, conversion and Peace

    1. Causes of war

    2. Arms race model

    3. Arms limitation

    4. Disarmament

    5. Conversion

    6. Adjustment costs

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APPENDIX B.   DEFINITIONS OF MILITARY EXPENDITURES

Definitions of Military Expenditures (Herrera, 1994, pp. 15-17)

A. North Atlantic Treaty Organization (NATO)

"All current and capital expenditures on the armed forces, in the running of defense departments and other government agencies engaged in defense projects as well as space projects; the cost of paramilitary forces and police when judged to be trained and equipped for military operations; military R&D, tests and evaluation costs; and costs of retirement pensions of service personnel including pensions of civilian employees. Military aid is included in the expenditure of the donor countries. Excluded are items of civil defense, interest on war debts and veterans' payments" (Şen, 1992, p.3 as cited in Herrera, 1994, p. 15).

B. International Monetary Fund (IMF)

"All expenditure, whether by defense or other departments, for the maintenance of military forces, including the purchase of military supplies and equipment (including the stockpiling of finished items but not the industrial raw materials required for their production), military construction, recruiting, training, equipping, moving, feeding, clothing and housing members of the armed forces, and providing remuneration, medical care, and other services for them. Also included are capital expenditures for the provision of quarters to families of military personnel, outlays on military schools, and research and development serving clearly and foremost the purposes of defense. Military forces also include paramilitary organizations such as gendarmerie, constabulary, security forces, border and customs guards, and other trained, equipped and available for use as military personnel. Also falling under this category are expenditures for purposes of strengthening the public services to meet wartime emergencies, training civil defense personnel, and acquiring materials and equipment for these purposes. Included also are expenditures for foreign military aid and contributions to foreign to international military organizations and alliances. This category excludes expenditures for non-military purposes, though incurred by a ministry or department of defense, and any payments or services provided to war veterans and retired army personnel" (Şen & Deger, 1986, Chapter 2, pp .37-59 as cited in Herrera, 1994, p. 15).

United Nations (UN)

The United Nations has framed the definition with three categories of military expenditures: (A) operating costs; (B) procurement and construction; and (C) research and development (Herrera, 1994, p. 17).

A. Operating costs

(1) Personnel

 a) conscripts; b) other military; c) civilian

(2) Operations and maintenance

 a) current-use material; b) maintenance and repairs; c) purchased services; d) rent.

B. Procurement and construction

(1) Procurement

 a) aircraft and engines; b) missiles, including conventional warheads; c) nuclear warheads and bombs; d) ships and boats; e) armored vehicles; f) artillery; g) other ordnance and ground force arms; h) ammunition; i) electronics and communications; j) non-armored vehicles.

(2) Construction

a) airbases; b) missile sites; c) naval bases; d) electronics and communications; e) personnel; f) medical; g) training; h) warehouses and depots; i) command, administration; j) fortifications; k) shelters.

C. Research and development

(1) Basic and applied

(2) Development, testing and evaluation.

APPENDIX C.   TURKEY'S CONTRIBUTION TO WAR ON TERRORISM AND PEACE SUPPORT OPERATIONS

Turkey's Contribution to War on Terrorism and Peace Support Operations (USCENTCOM)

- Contribution to War on Terrorism

    - Afghanistan/International Security Assistance Force (ISAF) Operation (since 2001)
    - Contribution to NATO Training Mission in Iraq
    - Operation Active Endeavor (OAE) And Black Sea Harmony (since 2001)
    - Turkey's Fight Against Drug-Trafficking in The Context of the Contributions to Counter-Terrorism

- Contribution of Turkish Armed Forces (TSK) to Peace Support Operations

    o Past Operations

    - United Nations Operation in Somalia (UNOSOM) (Between 02 January 1993 and 22 February 1994)
    - United Nations Peace Protection Force (UNPROFOR) - Bosnia-Herzegovina (Between 04 August 1993 and 20 December 1995)
    - NATO Implementation/Stabilization Force (IFOR/SFOR) -Bosnia-Herzegovina (Between 20 December 1996 and 02 December 2004)
    - Operation Sharp Guard (Between 13 July 1992 and 2 October 1996)
    - Operations Deny Flight/Deliberate Forge/Joint Guardian
    - Operation ALBA in Albania (during the period of 16 April to 01 August 1997)
    - Essential Harvest, Amber Fox, Allied Harmony, Concordia and Proxima Operations in Macedonia (between 27 August and 15 December 2005)
    - The Democratic Republic of the Congo (21 July and 01 December 2006)
    - NATO Humanitarian Assistance Operation in the aftermath of Hurricane Katrina (30 September and 08 October 2005)
    - Humanitarian Assistance Operation in the Aftermath of Pakistan Earthquake in 2005

    o Operations Currently Participated By Turkey

    - Bosnia-Herzegovina (since 02 December 2004)
    - Kosovo (since 24 March 1999)
    - Darfur/Sudan
    - Lebanon (since October 2006)

- In addition to Peace Support Operations, Turkey is currently involved in 3 military International Observer Missions in Hebron, Georgia and Sudan, and EU police Mission in the Democratic Republic of Congo.

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