

**MILITARY SPENDING MULTIPLIER OF TURKEY:
AN EMPIRICAL ANALYSIS FOR TURKEY**

A Master's Thesis

by

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Ankara

July 2006

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AN EMPIRICAL ANALYSIS FOR TURKEY**

**The Institute of Economics and Social Sciences
of
Bilkent University**

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July 2006

I certify that I have read this thesis and have found that it is fully adequate, in scope and in quality, as a thesis for the degree of Master of Business Administration.

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ABSTRACT

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This study estimates the military spending multiplier of Turkey over the period of 1980-2004 by employing a four-equation econometric model. The different views that appear in the literature on the relationship between defense spending and economic growth are identified and it is concluded that there is no agreement as to the exact nature of the relationship between defense spending and growth. The study also deals with the current trends in Turkish economy, analyzes government spending and military spending of Turkey. The results of this study indicate that defense expenditures have no significant direct or indirect effect on economic growth. On the other hand, there is an insignificant positive military spending multiplier of 0.03. In other words, 1 percent increase in military expenditures results in a 0.03 percent (not statistically significant) increase in GDP.

Keywords: Military expenditures, multiplier, Keynesian economics, peace dividend, economic growth.

ÖZET

TÜRKİYE’NİN ASKERİ HARCAMALAR ÇARPANI: TÜRKİYE İÇİN AMPİRİK BİR ÇALIŞMA

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Bu çalışma, dörtlü-denklemler ekonometrik modelini kullanarak, 1980-2004 yılları arasında Türkiye’de askeri harcamalar çarpanını ortaya koymaya çalışmaktadır. Literatürde savunma harcamaları ve ekonomik büyümeye etkisi hakkında yer alan çalışmalar incelenmiş ve ilişkinin yönü ve içeriği hakkında fikir birliğine varılamadığı görülmüştür. Çalışmada ayrıca Türkiye ekonomisindeki genel eğilimlere değinilmiş, ve kamu harcamaları ile askeri harcamalar analiz edilmiştir. Çalışma sonucunda askeri harcamaların istatistiksel olarak anlamlı doğrudan veya dolaylı bir etkisi olmadığı tespit edilmiştir. Öte yandan, istatistiksel olarak anlamlı olmayan 0.03 değerinde pozitif bir askeri harcama çarpanı bulunmuştur. Diğer bir ifadeyle, askeri harcamalarda yapılacak yüzde 1’lik bir artış, GSYİH’da yüzde 0.03’lük bir büyümeye neden olmaktadır.

Anahtar Kelimeler: Askeri harcamalar, çarpan, Keynesci ekonomi, barış kar payı, ekonomik büyüme.

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CHAPTER 1

INTRODUCTION

In all macroeconomics classes and debates, ‘Keynesian Economics’ is one of the major topics of the content. As all economists know, Keynesian economics is an economic theory stating that active government intervention in the marketplace and monetary policy is the best method of ensuring economic growth and stability. A supporter of Keynesian economics believes it is the government's job to smooth out the bumps in business cycles. Intervention would come in the form of government spending and tax breaks in order to stimulate the economy, and government spending cuts and tax hikes in good times, in order to curb inflation (Investopedia, 2006). Additionally, a multiplier effect – or, more completely, the spending/income multiplier effect – occurs when a change in spending causes a disproportionate change in aggregate demand. The local multiplier effect specifically refers to the effect that spending has when it is circulated through a local economy. For example, when the construction of a sports stadium is proposed, one of the suggested benefits is that it will raise income in the area by more than the amount spent on the project. (Wikipedia, 2006)

Briefly, Keynesians believe that government spending has a multiplier effect on the economy. Determining fiscal multipliers or government spending multipliers is an important issue in economics literature. However, there is little consensus about the sign and the value of fiscal multipliers. The results change according to the methods used,

country selected and the time period studied. Even, there is little consensus among papers searching the same country.

The main purpose of this thesis is to estimate the military spending multiplier in Turkey. In other words, the study used Turkish data from 1980 to 2004 in order to find if there is a multiplier effect of military spending in the economy. As a result three issues are investigated in order to find a reasonable solution:

- i. What is the direct effect of military expenditures on the GDP growth rate?
- ii. What are indirect effects of defense spending on the economic development?
- iii. What is the mechanism of defense spending and economic development interaction?

The study uses the four-equation econometric model of Gyimah-Brempong (1989). The total effect of defense spending on economic growth is the sum of the direct effect on economic growth and indirect effects through channels in investment and availability of skilled labor. The model is formed to estimate the direct and indirect effects of military spending on economic growth.

Empirical evidence highlights the stated conclusions below:

- i. There is not a statistically significant multiplier effect of defense spending on economic growth. This means that there is no relationship between defense spending and economic growth in Turkey.
- ii. There is an insignificant military spending multiplier of 0,031. The total effect of defense spending is positive on Turkish economic growth.

- iii. The effects of military spending on investment and skilled labor formation are also insignificant.
- iv. Defense spending is mainly shaped by the total government expenditures, the prevention of terrorism act, military coups and other non-economic factors.

The rest of this thesis is organized as follows: Chapter 2 explains the theoretical background. Keynesian economics, active fiscal policy, multiplier effect and peace dividend topics are notably stressed. Chapter 3 is a review of previous empirical studies dealing with military spending and economic development. Chapter 4 analyzes the current Turkish economic condition, government spending trend and military expenditures. The shares of government and military spending in GNP and the determinants of Turkish military spending are also studied. Chapter 5 explains the estimation method and the data used. Chapter 6 considers the regression results in detail. Chapter 7 concludes the thesis.

CHAPTER 2

THEORETICAL BACKGROUND

2.1. Keynesian Economics

As it is stated in Wikipedia Encyclopedia (2006), Keynesian economics, also called Keynesianism, is an economic theory based on the ideas of an English Economist, John Maynard Keynes (1883-1946), as put forward in his book '**The General Theory of Employment, Interest and Money**', published in 1936 in response to the Great Depression of the 1930s. Keynesian economics promotes a mixed economy, where both the state and the private sector play an important role. The rise of Keynesianism marked the end of *laissez-faire* economics¹. (Wikipedia, 2006)

Keynesian economics is an economic theory stating that active government intervention in the marketplace and monetary policy is the best method of ensuring economic growth and stability. A supporter of Keynesian economics believes it is the government's job to smooth out the bumps in business cycles. Intervention would come in the form of government spending and tax breaks in order to stimulate the economy, and government spending cuts and tax hikes in good times, in order to curb inflation. (Investopedia, 2006)

In Keynes's theory, general (macro-level) trends can overwhelm the micro-level behavior of individuals. Instead of the economic process being based on continuous improvements in potential output, as most classical economics had believed from the late 1700s on, Keynes

¹ Economic theory based on the belief that markets and the private sector could operate well on their own without state intervention.

asserted the importance of aggregate demand for goods as the driving factor of the economy, especially in periods of downturn. From this he argued that government policies could be used to promote demand at a macro level, to fight high unemployment and deflation of the sort seen during the 1930s.

A central conclusion of Keynesian economics is that there is no strong automatic tendency for output and employment to move toward full employment levels. This, Keynes thought, conflicts with the tenets of classical economics, and those schools, such as supply-side economics or the Austrian School, which assume a general tendency towards equilibrium in a restrained money creation economy. In neoclassical economics, which combines Keynesian macro concepts with a micro foundation, the conditions of General equilibrium allow for price adjustment to achieve this goal. More broadly, Keynes saw this as a general theory, in which resource utilization could be high or low, whereas previous economics focused on the particular case of full utilization (Wikipedia, 2006).

2.1.1. Historical Background

John Maynard Keynes was one of a wave of thinkers who perceived increasing cracks in the assumptions and theories, which held sway at that time. Keynes questioned two of the dominant pillars of economic theory: the need for a solid basis for money, generally a gold standard, and the theory, expressed as Say's Law, which stated that decreases in demand would only cause price declines, rather than affecting real output and employment. In his political views, Keynes was no revolutionary. He was pro-business and pro-entrepreneur, but was very critical of rentiers and speculators, from a somewhat Fabian perspective. He was a "new" or modern liberal.

It was his experience with the Treaty of Versailles, which pushed him to make a break with previous theory. Keynes (1920) not only recounted the general economics, as he saw them, in the Treaty, but the individuals involved in making it. In the 1920s, Keynes published a series of books and articles, which focused on the effects of state power and large economic trends, developing the idea of monetary policy as something separate from merely maintaining currency against a fixed peg. He increasingly believed that economic systems would not automatically right themselves to attain "the optimal level of production." This is expressed in his famous quote, "In the long run, we are all dead", implying that it doesn't matter that optimal production levels are attained in the long run, because it would be a very long run indeed.

In the late 1920s, the world economic system began to break down, after the shaky recovery that followed World War I. With the global drop in production, critics of the gold standard, market self-correction, and production-driven paradigms of economics moved to the fore. Dozens of different schools contended for influence. Some pointed to the Soviet Union as a successful planned economy, which had avoided the disasters of the capitalist world and even argued for a move toward socialism. Others pointed to the supposed success of fascism in Mussolini's Italy.

Into this tumult stepped Keynes, promising not to institute a revolution but to save capitalism. He circulated a simple thesis: there were more factories and transportation networks than could be used at the current ability of individuals to pay and that the problem was on the demand side.

But many economists insisted that business confidence, not lack of demand, was the root of the problem, and that the correct course was to slash government expenditures and to cut wages to raise business confidence and willingness to hire unemployed workers. Yet

others simply argued that "nature would make its course," solving the Depression automatically by "shaking out" unneeded productive capacity (Wikipedia, 2006).

2.1.2. Keynes and the Classics

Keynes explained the level of output and employment in the economy as being determined by aggregate demand or effective demand. In a reversal of Say's Law, Keynes in essence argued that "man creates his own supply," up to the limit set by full employment.

In "classical" economic theory—Keynes's term for the economics prior to General Theory (and specifically that of Arthur Pigou)—adjustments in prices would automatically make demand tend to the full employment level. Keynes, pointing to the sharp fall in employment and output in the early 1930s, argued that whatever the theory, this self-correcting process had not happened.

In the neo-classical theory, the two main costs are those of labor and capital. If there was more labor than demand for it, wages would fall until hiring began again. If there was too much saving, and not enough consumption, then interest rates would fall until either people cut saving or started borrowing. These two price adjustments would always enforce Say's Law, and therefore the economy would be at the optimal level of output (Wikipedia, 2006).

2.1.3. Wages and Spending

During the Great Depression, the classical theory defined economic collapse as simply a lost incentive to produce. Mass unemployment was caused only by high and rigid real wages. The proper solution was to cut wages.

Keynes argued that the determination of wages is more complicated. First, it is not real but nominal wages that are set in negotiations between employers and workers. It's not a barter relationship. Nominal wage cuts would be difficult to put into effect because of laws and contracts. Even classical economists admitted the existence of binding contracts and rules. Hence, Keynes argued that people would resist nominal wage reductions, even without unions, until they see other wages falling and a general fall of prices².

He also argued that boosting employment happens when real wages go down. More precisely, nominal wages have to fall more than prices. However, doing so would reduce consumer demand, and aggregate demand for goods. Business sales revenues and expected profits would decline. Investment would become more risky or less likely. Therefore, instead of raising business expectations, wage cuts could make matters much worse.

Moreover, if wages and prices were falling, people would start to expect them to fall. Further, this could make the economy spiral downward as those who had money would simply wait as falling prices made it more valuable—rather than spending. As Irving Fisher argued in 1933, in his Debt-Deflation Theory of Great Depressions, deflation (falling prices) can make a depression deeper as falling prices and wages made pre-existing nominal debts more valuable in real terms.

2.1.4. Excessive Saving

According to Keynes, excessive saving, i.e. saving beyond planned investment, was a serious problem encouraging recession even depression. Excessive saving results if investment falls, perhaps due to falling consumer demand, over-investment in earlier

² His prediction that mass unemployment would be necessary to deflate sterling wages back to pre-war gold values had been proven right in the 1920s.

years, or pessimistic business expectations, and if savings do not immediately fall in step.

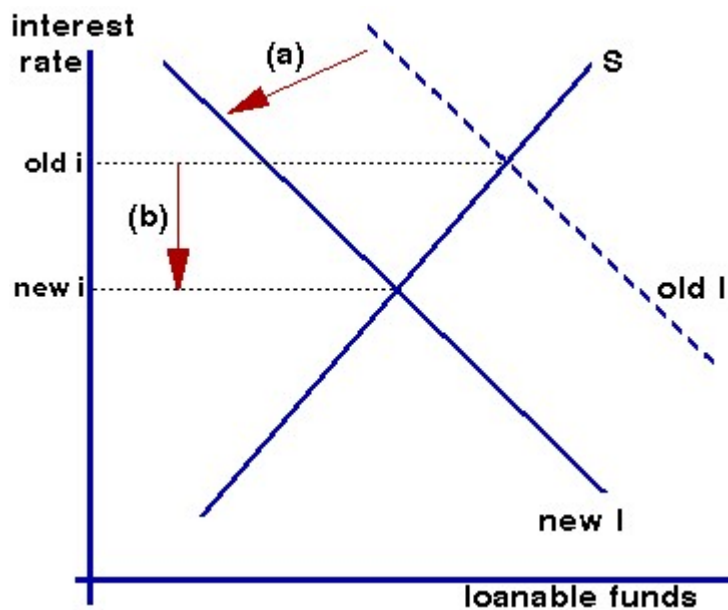


Figure 1. Excessive Savings Mechanism

Source: Wikipedia Encyclopedia (2006), Keynesian Economics.

The classical economists argued that interest rates would fall due to the excess supply of “loanable funds”³. Assume that fixed investment in plant and equipment falls from "old I" to "new I" (step a). Second (step b), the resulting excess of saving causes interest-rate cuts, abolishing the excess supply: so again we have saving (S) equal to investment. The decline in interest rate prevents that of production and employment.

Keynes had a complex argument against this *laissez-faire* response. The graph below summarizes his argument, assuming again that fixed investment falls (step A). Since the income and substitution effects of falling rates go in conflicting directions, saving does not fall as much as interest rates fall. Then, since planned fixed investment is mostly based on long-term expectations of future profitability, spending would not rise much as

³ For simplicity, other sources of the demand for or supply of funds are ignored here.

interest rates fall. Given the inelasticity of both demand and supply, a large interest-rate fall is needed to close the saving-investment gap seen from the figure. This requires a negative interest rate at equilibrium (where the new I line would intersect the old S line). However, this negative interest rate is not necessary to Keynes's argument.

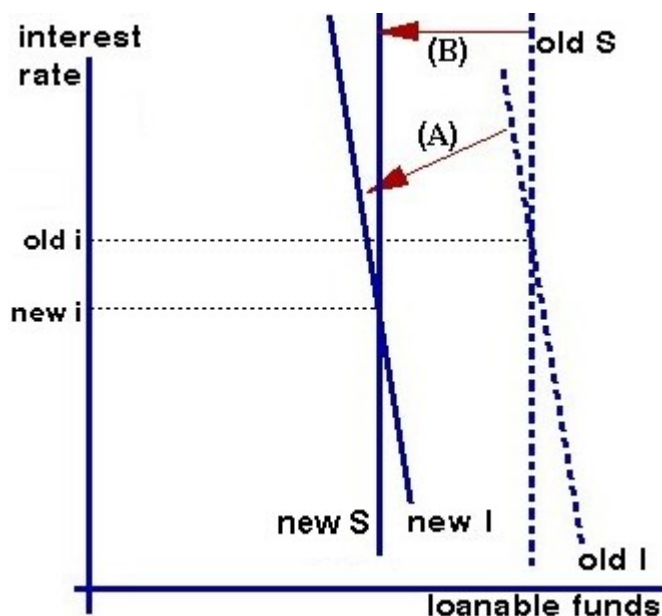


Figure 2. Interest Rate and Loanable Funds Mechanism

Source: Wikipedia Encyclopedia (2006), Keynesian Economics.

Keynes also argued that saving and investment are not the main determinants of interest rates, especially in the short run. Instead, the supply of and the demand for the stock of money determine interest rates in the short run. Neither change quickly in response to excessive saving to allow fast interest-rate adjustment.

Finally, because of fear of capital losses on assets besides money, Keynes suggested that there may be a "liquidity trap" setting a floor under which interest rates cannot fall⁴. Even economists who reject this liquidity trap now realize that nominal interest rates

⁴ In this trap, bond-holders, fearing rises in interest rates (because rates are so low), fear capital losses on their bonds and thus try to sell them to attain money (liquidity).

cannot fall below zero (or slightly higher). In the diagram, the equilibrium suggested by the new I line and the old S line cannot be reached, so that excess saving persists⁵. Even if this "trap" does not exist, there is a fourth element to Keynes's critique (perhaps the most important part). Saving involves not spending all of one's income. It thus means insufficient demand for business output, unless it is balanced by other sources of demand, such as fixed investment. Thus, excessive saving corresponds to an unwanted accumulation of inventories, or what classical economists called a "general glut". This pile-up of unsold goods and materials encourages businesses to decrease both production and employment. This in turn lowers people's incomes—and saving, causing a leftward shift in the S line in the diagram (step B). For Keynes, the fall in income did most of the job ending excessive saving and allowing the loanable funds market to attain equilibrium. Instead of interest-rate adjustment solving the problem, a recession does so. Thus in the diagram, the interest-rate change is small.

Whereas the classical economists assumed that the level of output and income was constant and given at any one time (except for short-lived deviations), Keynes saw this as the key variable that adjusted to equate saving and investment.

Finally, a recession undermines the business incentive to engage in fixed investment. With falling incomes and demand for products, the desired demand for factories and equipment (not to mention housing) will fall. This accelerator effect would shift the I line to the left again, a change not shown in the diagram above. This recreates the problem of excessive saving and encourages the recession to continue.

In sum, to Keynes there is interaction between excess supplies in different markets, as unemployment in labor markets encourages excessive saving—and vice-versa. Rather

⁵ Some (such as Paul Krugman) see this latter kind of liquidity trap as prevailing in Japan in the 1990s.

than prices adjusting to attain equilibrium, the main story is one of quantity adjustment allowing recessions and possible attainment of underemployment equilibrium (Wikipedia, 2006).

2.1.5. Active Fiscal Policy

As noted, the classical economists wanted to balance the government budget, through slashing expenditures or (more rarely) raising taxes. To Keynes, this would exacerbate the underlying problem: following either policy would raise saving (broadly defined) and thus lower the demand for both products and labor. For example, Keynesians see US. president Herbert Hoover's June 1932 tax hike as making the Depression worse.

Keynes's ideas influenced the next US. president Franklin D. Roosevelt's view on the insufficient buying-power caused the Depression⁶. During his presidency, he adopted some aspects of Keynesian economics, especially after 1937, when, in the depths of the Depression, the United States suffered from recession yet again. Something similar to Keynesian expansionary policies had been applied earlier by both social-democratic Sweden and Nazi Germany. But to many the true success of Keynesian policy can be seen at the onset of World War II, which provided a kick to the world economy, removed uncertainty, and forced the rebuilding of destroyed capital. Keynesian ideas became almost official in social-democratic Europe after the war and in the U.S. in the 1960s.

⁶ The Great Depression of 1929 was a worldwide economic downturn, starting in 1929 and lasting through most of the 1930s. It ended at different times in different countries. Almost all countries were affected. The worst hit were the most industrialized, including the United States, Germany, Britain, France, Canada, Australia, and Japan. Cities around the world were hit hard, especially those based on heavy industry. Construction virtually halted in the United States and other countries. Farmers and rural areas suffered as prices for crops fell by 40-60%. Mining and lumbering areas were perhaps the hardest hit because demand fell sharply and there was little alternative economic activity.

Keynes's theory suggested that active government policy could be effective in managing the economy. Rather than seeing unbalanced government budgets as wrong, Keynes advocated what has been called counter-cyclical fiscal policies, that is policies which acted against the tide of the business cycle: deficit spending when a nation's economy suffers from recession or when recovery is long-delayed and unemployment is persistently high—and the suppression of inflation in boom times by either increasing taxes or cutting back on government outlays. He argued that governments should solve short-term problems rather than waiting for market forces to self-correct.

This contrasted with the classical and neoclassical economic analysis of fiscal policy. Fiscal stimulus (deficit spending) could actuate production. But to these schools, there was no reason to believe that this stimulation would outrun the side-effects that "crowd out" private investment: first, it would increase the demand for labor and raise wages, hurting profitability. Second, a government deficit increases the stock of government bonds, reducing their market price and encouraging high interest rates, making it more expensive for business to finance fixed investment. Thus, efforts to stimulate the economy would be self-defeating. Worse, it would be shifting resources away from productive use by the private sector to wasteful use by the government.

The Keynesian response is that such fiscal policy is only appropriate when unemployment is persistently high, above natural level, "NAIRU⁷". In that case, crowding out is minimal. Further, private investment can be "crowded in": fiscal stimulus raises the market for business output, raising cash flow and profitability, spurring business optimism. To Keynes, this accelerator effect meant that government and business could be complements rather than substitutes in this situation. Second, as

⁷ NAIRU is the unemployment level, which is believed to be natural.

the stimulus occurs, gross domestic product rises, raising the amount of saving, helping to finance the increase in fixed investment. Finally, government outlays need not always be wasteful: government investment in public goods that will not be provided by profit-seekers will encourage the private sector's growth. That is, government spending on such things as basic research, public health, education, and infrastructure could help the long-term growth of potential output.

Invoking public choice theory, classical and neoclassical economists doubt that the government will ever be this beneficial and suggest that its policies will typically be dominated by special interest groups, including the government bureaucracy. Thus, they use their political theory to reject Keynes' economic theory.

In Keynes' theory, there must be significant slack in the labor market before fiscal expansion is justified. Both conservative and some neoliberal economists question this assumption, unless labor unions or the government "meddle" in the free market, creating persistent supply-side or classical unemployment. Their solution is to increase labor-market flexibility, i.e., by cutting wages, busting unions, and deregulating business.

It is important to distinguish between mere deficit spending and Keynesianism. Governments had long used deficits to finance wars. But Keynesian policy is not merely spending. Rather, it is the proposition that sometimes the economy needs active fiscal policy. Further, Keynesianism recommends counter-cyclical policies, for example raising taxes when there is abundant demand-side growth to cool the economy and to prevent inflation, even if there is a budget surplus. Classical economics, on the other hand, argues that one should cut taxes when there are budget surpluses, to return money to private hands. Because deficits grow during recessions, classicals call for cuts in outlays—or, less likely, tax hikes. On the other hand, Keynesianism encourages

increased deficits during downturns. In the Keynesian view, the classical policy exacerbates the business cycle.

2.1.6. Studies on the Effects of Active Fiscal Policy

Many researchers have investigated the effectiveness of active fiscal policy. But, there is little consensus about the impact of active fiscal policy on the economy. Among many others, Blanchard & Perotti (1999) show that fiscal multipliers are usually small, often close to 1, and over a long period fiscal deficits largely crowd out private investment. Moreover, Perotti (2002) argues that the effectiveness of fiscal policy may have declined in the past two decades. Mohanty & Scatigna (2003) states that at low levels of public debt, fiscal policy generates the usual Keynesian effects. However, when the debt levels rise to some critical limit, fiscal policy has unconventional contractionary effects. They also show that one indicator of the relative role of fiscal policy in macroeconomic stabilisation is the share of the government sector in total demand. The study of Mountford & Uhlig (2005) points out that unanticipated deficit-financed tax cuts work as a (short-lived) stimulus to the economy, not that they are sensible. And they concluded that the resulting higher debt burdens may have long-term consequences which are far worse than the short-term increase in GDP. Perotti (2004) studies the effects of fiscal policy in OECD countries. He states that the estimated effects of fiscal policy on GDP tend to be small: positive government spending multipliers larger than 1 can be estimated only in the US in the post-1980 period.

Dellas, Neusser & Walti (2005) searched the effects of fiscal policies in open economies. They showed that the macroeconomic effects of government spending shocks are greater, the lower the flexibility of the exchange rate and the smaller the degree of international capital mobility and the trade openness. The flexible price model

agrees with the latter two predictions but implies a weaker quantitatively relationship and moreover, it leaves no room for the exchange rate system to matter for fiscal policy (Dellas, Neusser & Wälti, 2005). On the other hand, Obstfeld (1991) argues that if the government cannot commit itself to a low fiscal deficit, it may depreciate the local currency. Giorgianni (1997) also argues that in countries with large fiscal deficits, expansionary fiscal policies increase the likelihood of debt consolidation and depreciate the domestic currency through its risk premium. He provides empirical evidence for this with Italian data. Gali, Salido & Valles (2003) stress the effect of timing of taxation on fiscal policy. They state that if only distortionary labor and/or capital income taxes were available to the government, the response of the different macroeconomic variables to a government spending shock will generally differ from the one that obtains in the economy with lump-sum taxes, and will depend on the consumption and timing of the taxation.

There are scarce studies searching the effects of active fiscal policy in Turkey. Agenor, McDermott & Ucer (1997) show that expansionary fiscal policy appreciates the temporary component of the real exchange rate for Turkey. Celasun, Denizer and He (1999) note a depreciation effect for Turkey. Fiscal policy affects the output through relative few transmission channels in Turkey compare to the US. Therefore, observing the effect of fiscal policy during a short period of time is reasonable (see Berument, 2003). Berument (2003) shows that when expansionary fiscal policy is identified with positive innovations in auction interest rates, output and prices increase and local currency depreciates.

2.1.7. Automatic Stabilizers

Automatic or built-in fiscal stabilizers refer to any element in the budget that acts to offset demand fluctuations by affecting government revenues and expenditures (see Auerbach & Feenberg (2000) and Cohen & Follette (2000)). These include all output-sensitive federal and state taxes as well as expenditures such as unemployment compensation benefits and other social security benefits that vary automatically with business cycles and without requiring prior legislative authorization (Mohanty & Scatigna, 2003).

Automatic stabilizers are more effective if they reduce uncertainty about future income (insurance channel) and create a wealth effect when individuals believe that changes in tax revenues would not alter the government's intertemporal budget constraint (wealth channel).

Automatic stabilisers have strong effects if households face significant borrowing or liquidity constraints (liquidity channel). Empirical evidence confirms that a high proportion of liquidity-constrained households and a low degree of income inequality that allow tax changes to be more dispersed across different income brackets help to improve the impact of automatic stabilizers (Mohanty & Scatigna, 2003).

“Empirical evidence shows that automatic stabilizers do not fully offset macroeconomic shocks so that discretionary action may add to the stabilizing potential. However, discretionary stabilizing actions suffer from considerable lags so that they appear to be badly timed and procyclical” (Capet, 2004).

2.2. The "Multiplier Effect" and Interest Rates

In economics, a multiplier effect – or, more completely, the spending/income multiplier effect – occurs when a change in spending causes a disproportionate change in aggregate demand. It is particularly associated with Keynesian economics; some other schools of

economic thought reject or downplay the importance of multiplier effects, particularly in the long run⁸ (Wikipedia, 2006).

2.2.1. Keynesian multiplier

Two aspects of Keynes's economic model had implications for multiplier effect policy: First, there is the "**Keynesian multiplier**", first developed by Richard F. Kahn in 1931. The effect on aggregate demand of any exogenous increase in spending, such as an increase in government outlays is a multiple of that increase—until potential is reached. Thus, a government could stimulate a great deal of new production with a modest outlay: if the government spends, the people who receive this money then spend most on consumption goods and save the rest. This extra spending allows businesses to hire more people and pay them, which in turn allows a further increase consumer spending. This process continues. At each step, the increase in spending is smaller than in the previous step, so that the multiplier process tapers off and allows the attainment of an equilibrium. This story is modified and moderated if we move beyond a "closed economy" and bring in the role of taxation: the rise in imports and tax payments at each step reduces the amount of induced consumer spending and the size of the multiplier effect.

⁸ The local multiplier effect specifically refers to the effect that spending has when it is circulated through a local economy. For example, when the building of a sports stadium is proposed, one of the suggested benefits is that it will raise income in the area by more than the amount spent on the project.

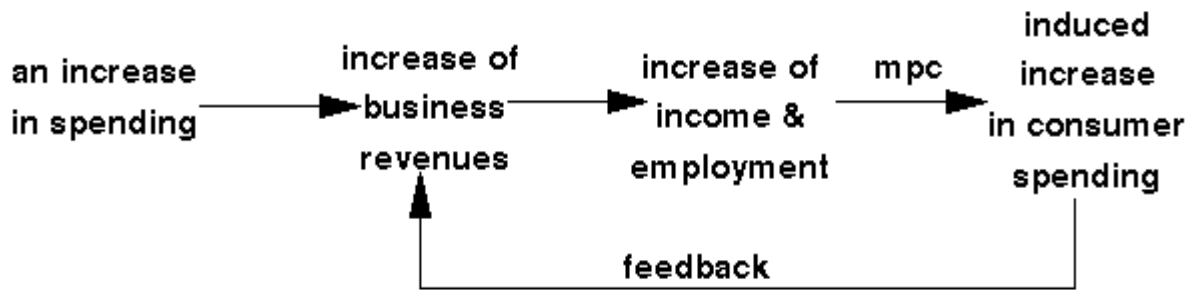


Figure 3. The Simple Multiplier Process

Source: Wikipedia Encyclopedia (2006), Multiplier Effect. (mpc: marginal propensity to consume)

Second, Keynes analyzed the effect of the interest rate on investment. In the classical model, the supply of funds (saving) determined the amount of fixed business investment. To Keynes, the amount of investment was determined independently by long-term profit expectations and, to a lesser extent, the interest rate. The latter opens the possibility of regulating the economy through money supply changes, via monetary policy. Under conditions such as the Great Depression, Keynes argued that this approach would be relatively ineffective compared to fiscal policy. But during more "normal" times, monetary expansion can stimulate the economy, mostly by encouraging construction of new housing.

2.2.2. Overview

The basic assumption of the multiplier effect is that the economy starts off with unused resources, for example, that many workers are cyclically unemployed and much of industrial capacity is sitting idle or incompletely utilized. By increasing demand in the economy it is then possible to boost production. If the economy was already at full

employment, with only structural, frictional, or other supply-side types of unemployment, any attempt to boost demand would only lead to inflation.

For various *laissez-faire* schools of economics, which embrace Say's Law and deny the possibility of Keynesian inefficiency and under-employment of resources, therefore, the multiplier concept is irrelevant or wrong-headed.

As an example, consider the government increasing its expenditure on roads by \$1 million, without a corresponding increase in taxation. This sum would go to the road builders, who would hire more workers and distribute the money as wages and profits. The households receiving these incomes will save part of the money and spend the rest on consumer goods. These expenditures in turn will generate more jobs, wages, and profits, and so on with the income and spending circulating around the economy.

The multiplier effect arises because of the induced increases in consumer spending which occur due to the increased incomes -- and because of the feedback into increasing business revenues, jobs, and income again. This process does not lead to an economic explosion not only because of the supply-side barriers at potential output (full employment) but because at each "round", the increase in consumer spending is less than the increase in consumer incomes. That is, the marginal propensity to consume (mpc) is less than one, so that each round some extra income goes into saving, leaking out of the cumulative process. Each increase in spending is thus smaller than that of the previous round, preventing an explosion (Wikipedia, 2006).

2.2.3. Details

Here, the marginal propensity to consume equals:

$$mpc = \Delta C / \Delta Y^d$$

Where C is consumer spending and Y^d is consumer disposable income.

If the multiplier process works as in a recession, the fall in demand creates its own unused resources, so that the basic assumption of the theory applies.

The eventual amount by which output expands is governed by the marginal propensity to save, which is the proportion of extra income that is saved rather than consumed. If the marginal propensity to save is large, less money is returned into the economy with each circulation so the multiplier effect is smaller. The value of the multiplier in a closed economy with no taxes is given by

$$mult = 1/(1 - mpc) = 1/s, s \neq 0.$$

Where s is the marginal propensity to save, i.e., the increase in consumer saving divided by the increase in consumer disposable income.

In this simple model, the multiplier can be used to predict changes in GDP (Y)⁹ for a given change in spending, X.

$$\text{Predicted } \Delta Y = mult * \Delta X$$

Clearly, taxes and imports tend to reduce the value of the multiplier ("leakage"). With these, the spending/income multiplier process is more complex.

$$mult = 1/mlr, mlr \neq 0.$$

where mlr is "marginal leakage rate".

This formula of the multiplier is obtained when we take into account the effects of all leakages.

⁹ $Y^d = Y$ only if taxes = 0. So, Y^d : disposable income, Y: GDP.

The value of the multiplier is less than $1/s$, since some of the demand stimulus or restraint leaks out to affect imports from the rest of the world and tax revenues. This weakening occurs because imports do not lead automatically to spending on the country's exports and increased tax revenues do not automatically cause increased government spending. Though this reduces the value of mult, it does not undermine the validity of the third equation above (Wikipedia, 2006).

2.3. Postwar Keynesianism

After Keynes, Keynesian analysis was combined with classical economics to produce what is generally termed "the neoclassical synthesis" which dominates mainstream macroeconomic thought. Though it was widely held that there was no strong automatic tendency to full employment, many believed that if government policy were used to ensure it, the economy would behave as classical or neoclassical theory predicted.

In the post-WWII years, Keynes's policy ideas were widely accepted. For the first time, governments prepared good quality economic statistics on an ongoing basis and a theory that told them what to do. In this era of new liberalism and social democracy, most western capitalist countries enjoyed low, stable unemployment and modest inflation.

It was with John Hicks that Keynesian economics produced a clear model which policy-makers could use to attempt to understand and control economic activity. This model, the IS-LM model is nearly as influential as Keynes' original analysis in determining actual policy and economics education. It relates aggregate demand and employment to three exogenous quantities, i.e., the amount of money in circulation, the government budget, and the state of business expectations. This model was very popular with economists after World War II because it could be understood in terms of general

equilibrium theory. This encouraged a much more static vision of macroeconomics than that described above.

The second main part of a Keynesian policy-maker's theoretical apparatus was the Phillips curve. This curve, which was more of an empirical observation than a theory, indicated that increased employment, and decreased unemployment, implied increased inflation. Keynes had only predicted that falling unemployment would cause a higher price, not a higher inflation rate. Thus, the economist could use the IS-LM model to predict, for example, that an increase in the money supply would raise output and employment—and then use the Phillips curve to predict an increase in inflation.

Through the 1950s, moderate degrees of government demand leading industrial development, and use of fiscal and monetary counter-cyclical policies continued, and reached a peak in the "go go" 1960s, where it seemed to many Keynesians that prosperity was now permanent. However, with the oil shock of 1973, and the economic problems of the 1970s, modern liberal economics began to fall out of favor. During this time, many economies experienced high and rising unemployment, coupled with high and rising inflation, contradicting the Phillips curve's prediction. This stagflation meant that both expansionary (anti-recession) and contractionary (anti-inflation) policies had to be applied simultaneously, a clear impossibility. This dilemma led to the rise of ideas based upon more classical analysis, including monetarism, supply-side economics and new classical economics. This produced a "policy bind" and the collapse of the Keynesian consensus on the economy (Wikipedia, 2006).

2.4. Military Keynesianism

Military Keynesianism is a government economic policy in which the government devotes large amounts of spending to the military in an effort to increase economic growth. This is a specific variation on Keynesian economics.

2.4.1. Economic Effects

The economic impacts of military spending can be explained using four views: two on the demand side and two on the supply side.

On the demand side, increased military demand for goods and services is generated directly by government spending. Secondly, this direct spending induces a multiplier effect of general consumer spending. These two effects are directly in line with general Keynesian economic doctrine.

On the supply side, the maintenance of a standing army removes many workers, usually young males with less skills and education, from the civilian workforce. This demographic group ordinarily faces an especially high level of unemployment; some argue that drawing them into military service helps prevent crime or gang activity. In the United States, enlistment is touted as offering direct opportunities for education or skill acquisition, possibly to target this demographic.

In this sense, the military might act as an employer of last resort – it is an employment opportunity which tends to hire from the bottom (least qualified) part of the workforce, provides a decent standard of living, serves a useful social purpose, and offers jobs regardless of the state of the general economy.

Also on the supply side, it is often argued that military spending on research and development (R&D) increases the productivity of the civilian sector by generating new

infrastructure and advanced technology. Frequently cited examples of technology developed partly or wholly through military funding but later applied in civilian settings include radar, nuclear power, and the internet (Wikipedia, 2006).

2.4.2. Criticisms

The primary criticism of military Keynesianism faults not its economic intuitions but adverse social effects. Many assert that the maintenance of large peacetime armies and growth of military spending will lead a nation into war, while also encouraging militarism and nationalism. These critics often attack the argument that the military prevents young men from sinking into crime by claiming that many soldiers who return from war are worse off physically or mentally than they would have been as an unemployed worker at home.

A similar critique is military Keynesianism accelerates the growth of a military-industrial complex – industrial sectors largely dependent on military spending. Because the military-industrial complex is a large employer and constitutes a significant fraction of aggregate demand, it is politically difficult for the government to reduce deficit spending. The end result of this, it is feared, is a cycle of constant war and continually high military spending.

Other critics point out that while military R&D can sometimes find later application in civilian industries, it is less efficient than simply researching civilian applications directly. Many point to the recent examples of Japan and Germany, economies which have had great success in developing new technology despite low military spending compared to nations like the United States.

Finally, some critics, and even some supporters, contend that in the modern world, these policies are no longer viable for developed countries because military strength is now built on high-technology professional armies, and the military is thus no longer viable as a source of employment of last resort for uneducated young people (Wikipedia, 2006).

2.4.3. Evidence of Military Keynesianism

While the term was not in use at the time, the clearest historical example of military Keynesianism in action is usually acknowledged to be 1930s Germany, which rebuilt a crippled economy with enormous military production under a fascist government. This example illustrates both the potential positives of such policies in generating rapid growth, and also the negative social effects presented by critics.

In today's discourse, the term is most frequently discussed in relation to the United States, particularly the administration of President Ronald Reagan in the 1980s. Reagan's administration pushed for significant tax cuts, while increasing military spending to combat the Soviet Union. While this was in practice a policy suggestive of military Keynesianism, Reagan's reasoning for the policy was not that it would spur economic growth, but that military spending was necessary to combat the threat of Communism.

For many in the United States worried about the adoption of these economic policies, fears of this were somewhat averted by reduced military spending in the 1990s in what was commonly described as a peace dividend for the end of the Cold War. However, the War on Terrorism and War in Iraq have brought such concerns to prominence once more (Wikipedia, 2006).

2.5. Peace dividend

The peace dividend is a political slogan purporting to describe the economic benefit of a decrease in defense spending. It is used primarily in discussions relating to the guns versus butter theory. The term was frequently used at the end of the Cold War, when many Western nations significantly cut military spending.

The concept of a "peace dividend" assumes that the budget for defense spending will be at least partially redirected to social programs and/or economic growth. The existence of a peace dividend in real economies remains unproven. Most economies, in contrast, undergo a recession after the end of a major conflict as the economy is forced to adjust and retool (Wikipedia, 2006). Clements, Gupta, & Schiff (1996) claim that a sizable peace dividend was achieved from 1985 to 1996 in the World.

In his study, Richard JOLLY (2003) states "In common with many other countries, the US marked the end of the Cold War with a rapid reduction in its military spending over the 1990s. At the same time however it cut government spending, leading many to argue that the promised 'Peace Dividend' had not materialized. A more considered analysis revealed, however, that the reduction in US military spending resulted in major reductions in the US government deficit and in interest rates over the 1990s. These reductions were major forces behind the growth of the US economy in the 1990s, helping to make it the longest lasting period of growth in US history. This growth in turn had a positive impact on the global economy – making the US the locomotive of the world economy, with actual and potential benefits to the poorest and lowest income countries. Had it not been for the 'stop-go' policies of the Bretton Woods Institutions and the disruptive effects of local conflicts encouraged by the arms trade, the positive

effects of reductions in US military expenditure would have been felt wider still across the developing world.”

Davoodi, Clements, Schiff, & Debaere (2001) presents evidence that the easing of international and regional tensions is systematically related to subsequent reductions in military spending and the higher share of nonmilitary spending in total spending. They also state that peace is a public good; mutual reductions in military spending across borders have multiplier effects that are beneficial to all parties concerned.

Klein (2002) focuses on the relationship between macroeconomic prosperity and peace effect. He states that “After the end of the Cold War, we (USA) entered a decade of extremely rapid and favorable expansion. Even though there was considerable reduction in defense spending and in the size of the military establishment the economy of the US enjoyed a remarkable period of prosperity. From the point of view of economic analysis, the period of the ‘Peace Dividend’ showed why simplistic multiplier calculations of changes in government spending and the simultaneous changes in GDP do not, by themselves, show the underlying causal pattern of what is happening in the macroeconomy. The total economy consists of a very large number of interrelated sectors and variables and not just bivariate relationships between aggregate public spending and aggregate economic activity - surely not a reliable relationship between defense outlays and GDP alone.”

CHAPTER 3

LITERATURE REVIEW

3.1. Studies in the World

Although many studies have investigated the relationship between defense spending and its effects on the economy, there is little that presents a Keynesian type military spending multiplier. And, there is no widely accepted conclusion about the effects of military expenditures on economy. The empirical studies focusing on military expenditures – economic growth relationship give conflicting results. What is more, there is no general belief about the effects of government spending on economy. The effectiveness of fiscal policy is also a common debate.

The generally accepted starting point for much research in this area is Benoit's study (1973) on the defense growth relationship. He applied a cross-section correlation analysis by using a single-equation model to 44 less developed countries (LDCs) for the period 1950 – 1965 and concludes that there is a positive and significant relationship between the amount of resources devoted to defense and economic growth. He also argues that the direction of causation is from defense spending to economic development, but not the other way around. His finding was criticized by many researchers in terms of his methodology, the analysis he made, and the data he used. Despite some of its drawbacks, Benoit's study is regarded as one of the most important studies in this area.

Since then, the methodologies and data have been developed, and the frameworks of the models have been better established. However, in the defense economics literature, the issue of military expenditure and economic growth has not reached a clear-cut agreement yet.

3.2. Different Views on the Relationship Between Defense Spending and Economic Growth

There is no widespread consensus about the relationship between defense spending and economic growth. Many researchers have investigated the link between these two phenomenon, but because of different perspectives and methodologies, never has a satisfactory consensus been acquired. The results of these researchers can be evaluated in three groups. The first group supports that defense spending has a positive effect on economic development. The relationship is significant and defense spending can be used as a successful fiscal policy device. The second group claims that the effects of military expenditures are negative on the economy. They also assert that defense burden uses the scarce resources of the economy and affects unfavorably. The third group supports that there is no direct and significant relationship between defense spending and economic growth. They support that military expenditures cannot be used as economic tools to achieve national prosperity. Some of these studies present a military spending multiplier – negative or positive –, while others only focus on defense-growth relationship and causality. The detailed conclusions that have been supported for each of these possibilities are reviewed below:

3.2.1. Defense Spending has Positive Effect on Economic Growth

A group of scholars, Benoit (1973, 1978), Frederiksen & Looney (1983), and Weede (1986), employing single equation models and using data from a sample of LDCs, conclude that there is a positive and significant relationship between defense spending and economic growth. These authors have argued that the positive effects defense spending has on economic development stem from technological spin-off, skilled labor from the military, the modernization of attitudes the military fosters, the higher portion of R&D studies defense projects stimulates, and the employment of otherwise idle resources in defense related uses due to Keynesian-type demand effects. As a result, defense spending augments aggregate demand, enhances purchasing power, and causes positive side effects. Extra contracts arising from military affairs generate more jobs and increase the welfare of workers and suppliers. And this increased income will return to the economy cyclically. Through this increased process of increased demand and employment, military expenditures enhance economic growth (De Grasse, 1983). Using the Feder–Ram models, Ram (1986), Ateşoğlu & Mueller (1990) and Ward et al. (1991) found a positive impact of defense spending on economic growth. Dunne & Nikolaidou (2001) using Granger causality test with a VAR methodology to allow for cointegration between the variables showed a positive impact of military burden on growth in Greece. A positive effect of Turkish defense spending is supported by Sezgin (1997; 1999; 2001), Yıldırım and Sezgin (2002), Candar (2003), Halıcıoğlu (2004), and Sezgin, Yıldırım and Öcal (2005). Sezgin (1997), employing a Feder–Ram model, found a positive effect. Sezgin (1999, 2001) using a Değer type model also showed a positive effect of military expenditures on growth. Yıldırım and Sezgin (2002) showed a positive impact of military expenditures on economic growth by using a non-theoretical VAR

model, which included real income, real savings, real military expenditure, labor force, and real balance of trade variables. Candar (2003) using cointegration analysis of Engle-Granger (1987) two step procedure and the data over the period of 1950–2001 shows that military spending has a positive effect on economic growth in the long run as well as in the short run. The study of Halicioğlu (2004) provides an empirical relationship between the real Turkish defense spending and the real Turkish output by employing the new macroeconomic theory (Taylor, 2000) and the multivariate cointegration technique. Sezgin, Yıldırım and Öcal (2005) investigate the military expenditure economic–growth relationship for Middle Eastern countries and Turkey for the period 1989–1999 using cross-section and dynamic panel estimation techniques. They developed the model from Ward *et al.* (1991), which produces the final form of the Feder (1983) model with separate externality effects and factor productivity differentials of defense expenditure. They find that military expenditure enhances economic growth in the Middle Eastern countries and Turkey as a whole and the factor productivity differentials are positive: it implies that the defense sector is more productive than the civilian sector, probably because the defense sector uses high-technology compared with rest of economies in the Middle East.

The first attempts of defense-growth relationship studies using Feder-Ram model in Turkey mostly find positive effects as it is criticized by Sandler & Hartley (1995, pp. 206–209) who states that the Feder-Ram type model is inherently structured to find a positive impact of military expenditure on economic growth.

3.2.2. Defense Spending has Negative Effect on Economic Growth

The set of studies including Lim (1983), Smith (1977), and Faini, Annez & Taylor (1984), using single equation models and data from LDCs in general, conclude that increased military expenditures results in decreased economic growth. These studies argue that increased defense spending decreases resources available for investment, and that this negative effect outweighs any direct positive effects defense spending has on economic development. Nabe (1983) constructs an iterative model in which **economic development factors** are made to depend upon defense; **social development factors** depend upon economic development factors and defense; **economic growth rate** in turn depends on economic development factors, defense and social development factors. Using data from a sample of African countries, he concludes that defense spending is negatively related to economic growth rate. Nabe's model was criticized on its simultaneity problem and its transmission mechanism.

Değer & Smith (1983) estimate a three equation simultaneous model. In their model equations for growth rate, savings, and defense burden are specified. Using data from a sample of LDCs, Değer & Smith find that defense spending has a significant negative effect on economic growth. They estimated the defense burden/growth rate multiplier as -0.26.

Değer (1986) applies a three equation – economic growth, savings, and defense burden – simultaneous model to investigate the relationship between defense spending and economic growth, using data from a sample of LDCs. In her model, before estimating the system of equations, she applies single equation models to identify variables to be included in each equation. She finds a positive direct relationship between defense spending and economic growth. She attributes the result to Keynesian-type demand

effects, technological spin-off and modernization. However, she found that defense burden decreases savings rate and hence decreases economic growth. This negative indirect effect exceeds the direct positive effects. She estimated the defense burden/growth rate multiplier as -0.22.

Lebovic and Ishaq (1987) examined defense-growth issue for 20 Middle Eastern countries, in the framework of a Keynesian demand model for the period 1973–1982. They developed a three-equation model employing panel data analysis and report a negative effect of military expenditure on economic growth. Abu-Bader and Abu-Qarn (2003) investigated the causal relationship between military expenditure and economic growth for Egypt, Israel and Syria for the last three decades. They report that defense expenditures hinder economic growth for all three countries.

Galvin (2003) applying cross-section data analyses with a demand and supply side model using simultaneous equation methodologies (2SLS and 3SLS) shows that defense spending has a negative impact on both the rate of economic growth and the savings-income ratio in 64 developing economies. Yet the study also indicates that the effect is greater for middle-income nations, which may have less to gain from defense sector spill-overs. Her results also indicate that strategic factors, as much as economic constraints, determine defense spending in developing countries.

With regard to the single demand-side equations, Smith (1980), Faini et al. (1984) and Rasler & Thomson (1998) showed a negative impact of military spending on growth. Also, regarding the single country analysis of military expenditure–economic growth relationship, DeRouen (2000) reports that military expenditure hinders economic growth in Israel.

Using the Granger–Causality analysis, Sezgin (2000) showed that there exists a negative impact of military expenditure on economic growth for Turkey.

Finally, apart from a few countries, evidence from most of the simultaneous equation models indicates a negative impact of military expenditures on economic growth (Değer, 1986; Antonakis, 1997).

The results are also related with the model used. That is, as Candar (2003) states, in majority of the studies using demand and supply-side (Değer type) models, the relationship between defense spending and growth is negative (Değer & Smith 1983, Değer 1986, Lebovic & Ishaq 1987, Gyimah-Brempong 1989, Scheetz 1991, and Dortmans et al. 1995).

3.2.3. Defense Spending has No Effect on Economic Growth

Biswas & Ram (1986), using a single equation augmented neoclassical growth model, finds that defense spending has no significant effect on economic growth in their sample. They conclude that whether one finds a positive or a negative relationship between defense spending and economic development depends on the geographical coverage of the sample, the sample period, and model specification.

Using the Feder–Ram models, Alexander (1990) and Huang & Mintz (1991) also concluded that there exists no relationship at all.

Dakurah et al. (2001) using cointegration and error correction models for 62 countries found no common causal relationships between the military burden and economic growth.

Heo & Hahm (2004) using a multi-link defense-growth model based on macroeconomic theories while still accounting for political influences and empirically testing it with South Korean data for 1963-2001 showed that an increase in defense spending has a significant and delayed negative effect on private investment, employment, and export; and has no significant direct impact on growth. Özsoy (2000), employing a Feder–Ram model, showed that defense spending has no impact on economic growth in Turkey. Kelly & Rishi (2003) explore the spin-off effect controversy surrounding the role of military spending in economic development by investigating its impact on output in six industries linked to the military. Their results suggest that military spending's direct impact on output in each industry is negative or insignificant depending on whether adjustments for trade in armaments are made. The results also fail to substantiate physical and human capital spin-off effects. And they conclude that the case for spin-off effects has been exaggerated.

Finally, it is noteworthy to state that most of the supply-side (Feder type) studies showed that defense spending has no significant impact on economic growth or a small positive effect (see Candar, 2003).

CHAPTER 4

TURKISH ECONOMY, GOVERNMENT SPENDING AND MILITARY EXPENDITURES

4.1. Current State of the Turkish Economy

Turkey is situated at the crossroads where two continents meet. She is among the 20 largest economies of the world with her GDP of \$361 billion in 2005. Also, she is the largest economy in Eastern Europe and the Middle East.

The Turkish economy was re-modeled and became more outward looking with the structural adjustment program launched in the 1980s. The establishments of money and capital markets, the liberalization of exchange and interest rates and other prices have enhanced the effectiveness of monetary, fiscal and income policies. Liberalized import regime, new foreign investment and export promotion policies have enabled Turkey to take its place in the global economy. In this context, a serious economic growth has been accompanied by a significant change in the composition of the GDP; the share of industry, and particularly services, has marked an important increase.

Turkey's dynamic economy is a complex mix of modern industry and commerce along with a traditional agriculture sector that still accounts for more than 35% of employment. It has a strong and rapidly growing private sector. The largest industrial sector is textiles and clothing, which accounts for one-third of industrial employment; it faces stiff competition in international markets with the end of the global quota system. However, other sectors, notably the automotive and electronics industries are rising in importance within Turkey's export mix. Real GNP growth has exceeded 6% in many

years, but this strong expansion has been interrupted by sharp declines in output in 1994, 1999, and 2001¹⁰. The economy is turning around with the implementation of economic reforms, and 2004 GDP growth reached over 9%. Inflation fell to 7.7% in 2005 - a 30-year low.

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.¹¹

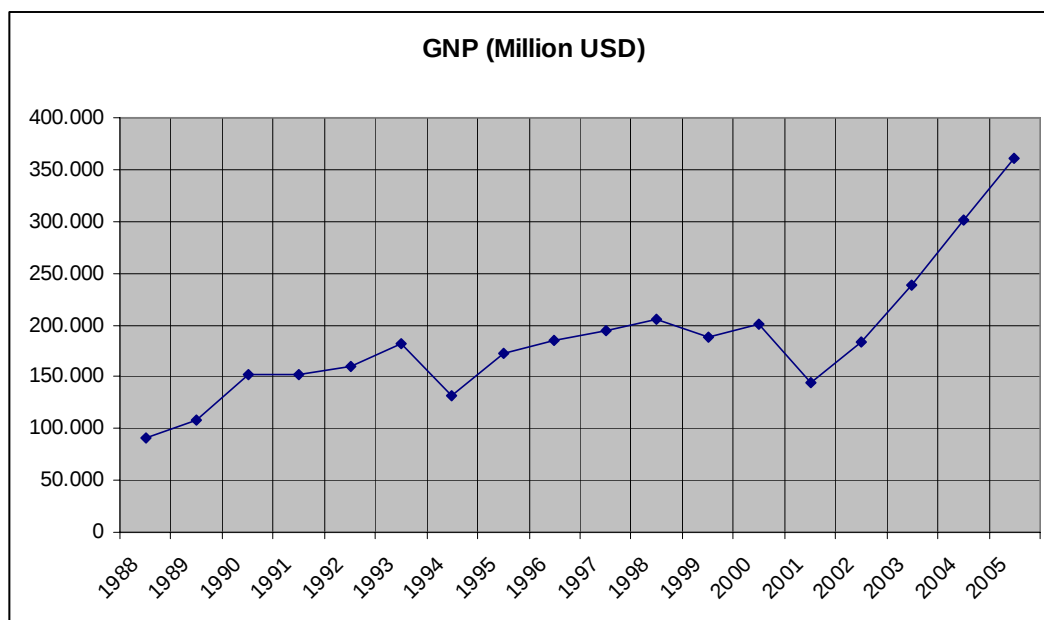


Figure 4. Turkish Gross National Product

Source: State Planning Organization, Economic Indicators 2005.

GNP per capita in 2005 was \$5008 at current prices and \$8475 in purchasing power parity.

¹⁰ State Planning Organization, Economic Indicators 2005

¹¹ The World Fact Book, Central Intelligence Agency (CIA), 2006

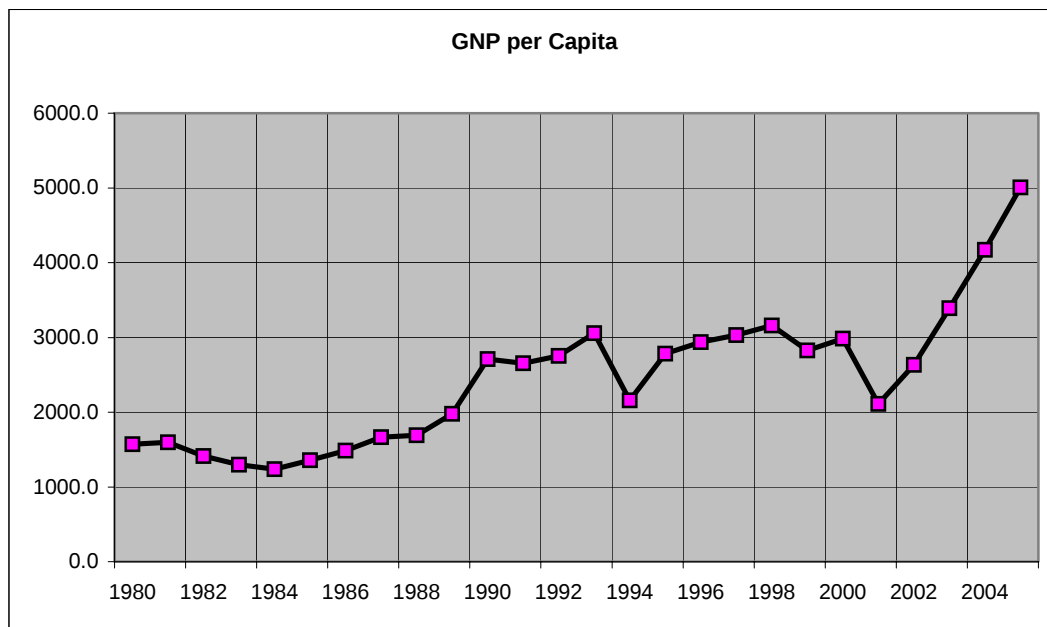


Figure 5. Turkish GNP per Capita

Source: State Planning Organization, Economic Indicators 2005.

GNP growth rates for the last four years were 7.9% in 2002, 5.9% in 2003, 9.9% in 2004 and 7.6% in 2005.¹²

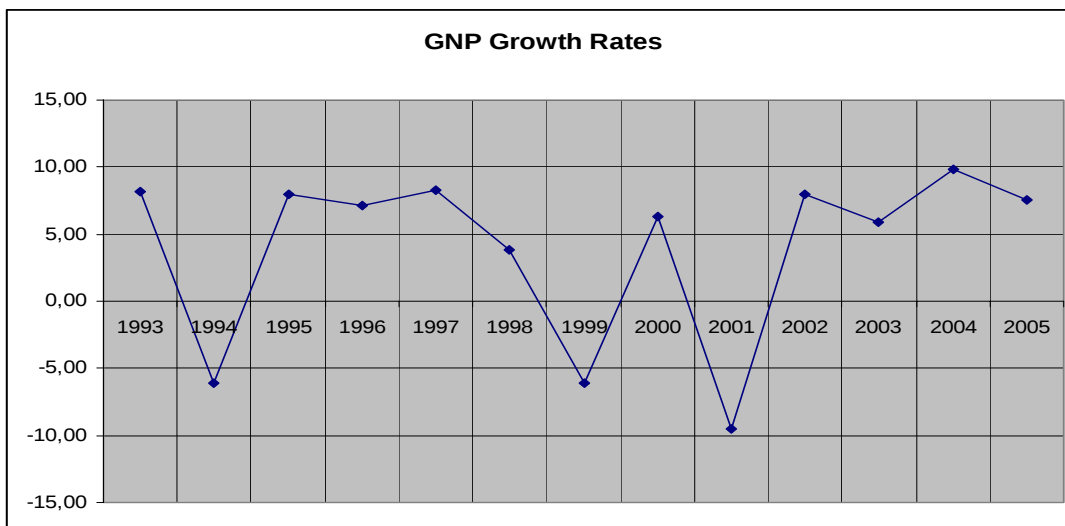


Figure 6. Turkish Gross National Product Growth Rates

Source: State Planning Organization, Economic Indicators 2005

¹² Turkish Statistical Institute, March 31st 2006

The main reasons behind the development are the structural reforms that have been put in place during the last four years, the strengthening of the economy's institutional structure and the introduction of a growth model focused on the private sector.

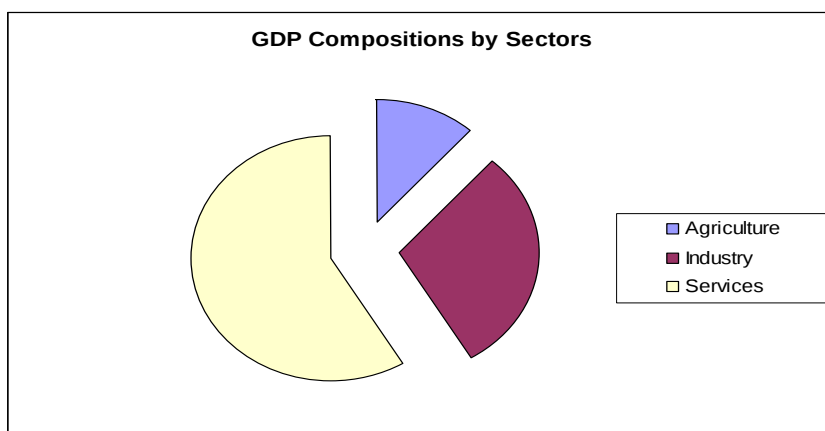


Figure 7. GDP Compositions by Sectors in Turkey

Source: State Planning Organization, Economic Indicators 2005

GDP compositions by sectors are 11.7% in agriculture, 29.8% in industry and 58.5% in services in 2005. The population is estimated to reach 72.1¹³ million in mid 2006. Total labor force of Turkey is 24.7 million in 2005. Shares of labor force by occupation are 35.9% in agriculture, 22.8% in industry, and 41.2% in services according to third quarter of 2004. Unemployment rate is 11.8%, and underemployment is 4.2% in April 2006.

Ratios of government budget deficits to GNP were, 16.2% in 2001, 14.2% in 2002, 11.2% in 2003, 7.1% in 2004 and 2.0% in 2005.¹⁴ The main reason in this reduction is the tight fiscal discipline that was implemented since 2001.

Inflation rates were 107.3% in 1994, 81.2% in 1997, 50.9% in 2000, 55.3% in 2001, 44.4% in 2002, 22.5% in 2003, 9.5% in 2004 and 7.7% in 2005.

¹³ Turkish Statistical Institute. Last census was in 2000. Estimates are for Mid-Year population from 2000 onward.

¹⁴ Turkish Statistical Institute, Statistical Indicators 1923-2004, Ankara 2005

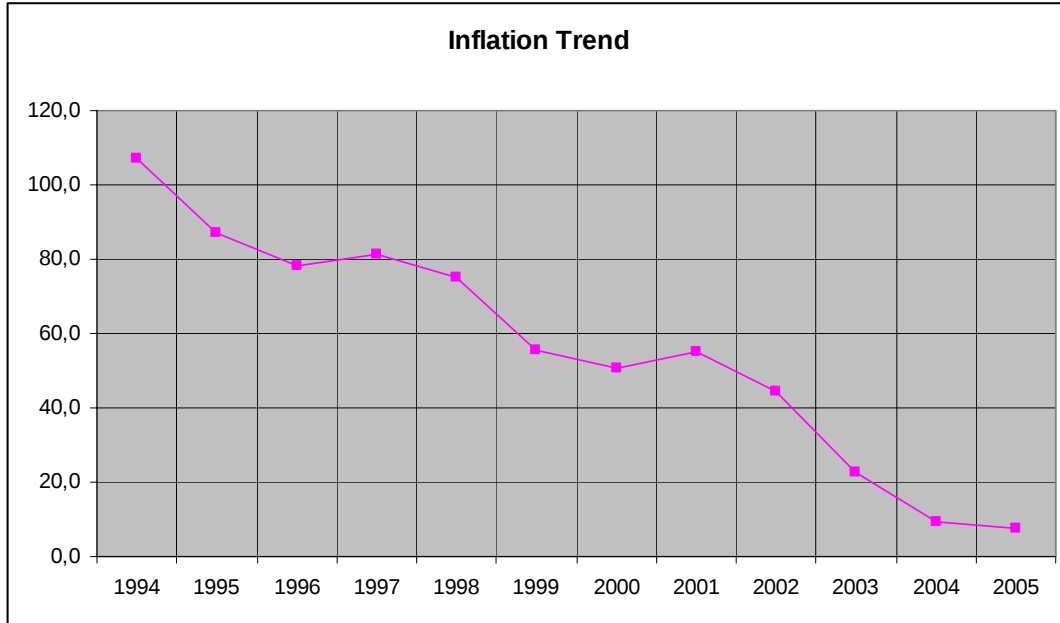


Figure 8. Inflation Trend in Turkey

Source: State Planning Organization, Economic Indicators 2005

The investment amount reached 20.3% of GNP in 2005. On the other hand, the foreign debt stock reached \$170.1 billion in 2005. The foreign debt stock was standing at the \$162.2 billion at the end of the previous year, which implies \$7.8 billion increase in 2005.

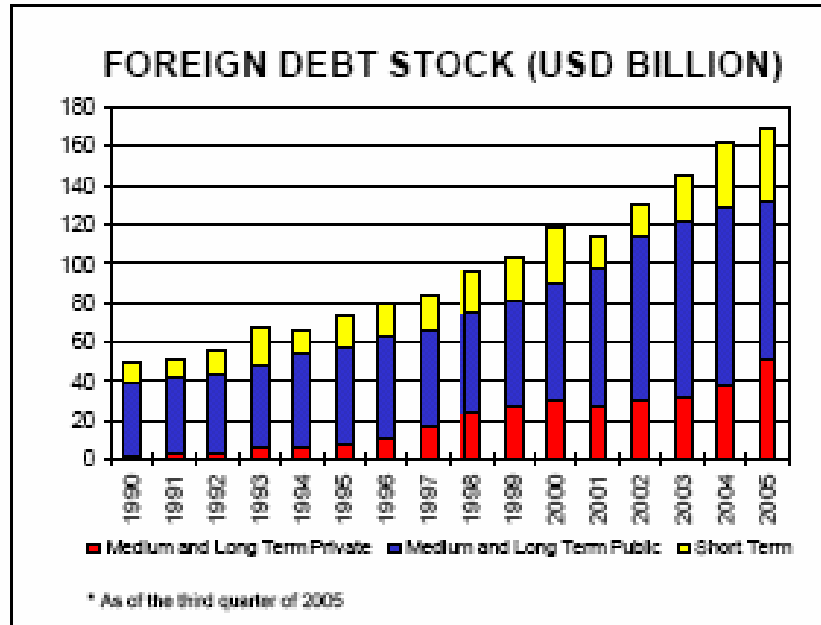


Figure 9. Foreign Debt Stock of Turkey

Source: Turkish Central Bank, Database 2006.

The rise in the foreign debt stock in 2005 stemmed solely from the rise in private sector's debt stock, whereas the public sector's debt stock declined considerably. More precisely, the private sector's foreign debt stock surged by USD 19.9 billion in 2005, of which USD 6.2 billion was short-term debt and USD 13.7 billion was long-term debt. The foreign debt stock of the public sector, on the other hand, fell by \$12.1 billion during the period under consideration. Although the foreign debt stock increased in nominal terms in 2005, it continued to decline as a ratio to the GDP. In fact, the foreign debt stock GDP ratio fell to 46.8% in 2005, compared to 53.6% in 2004. This ratio was as high as 78.2% in 2001. The decline in public sector's debt stock during this period is even more impressive. The public sector's foreign debt stock to GDP ratio fell to 22.9% in 2005, from 31.5% in 2004. As a result, the public sectors total debt stock (including the Central Bank) fell to the 75.5% of the GDP in 2005, compared to 83.9% a year ago.

The public sector's total debt stock as a ratio to GDP was 127.5% in 2001, which indicates 52 percentage points decline in 4 years.¹⁵

Since 2002, IMF-backed reform program has delivered a sustained improvement in economic performance. Despite outside shocks, financial market confidence has strengthened. Interest rates have declined significantly (from 70% to 14%) and Turkish lira has remained strong.

In addition to fiscal discipline in recent years, the main objective of monetary policy over the course of the program was to reduce inflation towards EU levels. To mark the success in disinflation and strengthened confidence in the Turkish lira, in January-2005, Turkey introduced a new redenominated currency (dropping six zeros). The introduction of the new Turkish lira was extremely smooth, further enhancing policy credibility.

On the other hand, there are some weak links in Turkish economy. Despite the strong economic gains in 2002-05, 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. Trade deficit was \$37,373 million in 2004, and increased by 25.3% to the amount of \$43,076 million in 2005.

¹⁵ Yapi Kredi Bank A.S. Economic Research Department, Monthly Bulletin, April 2006

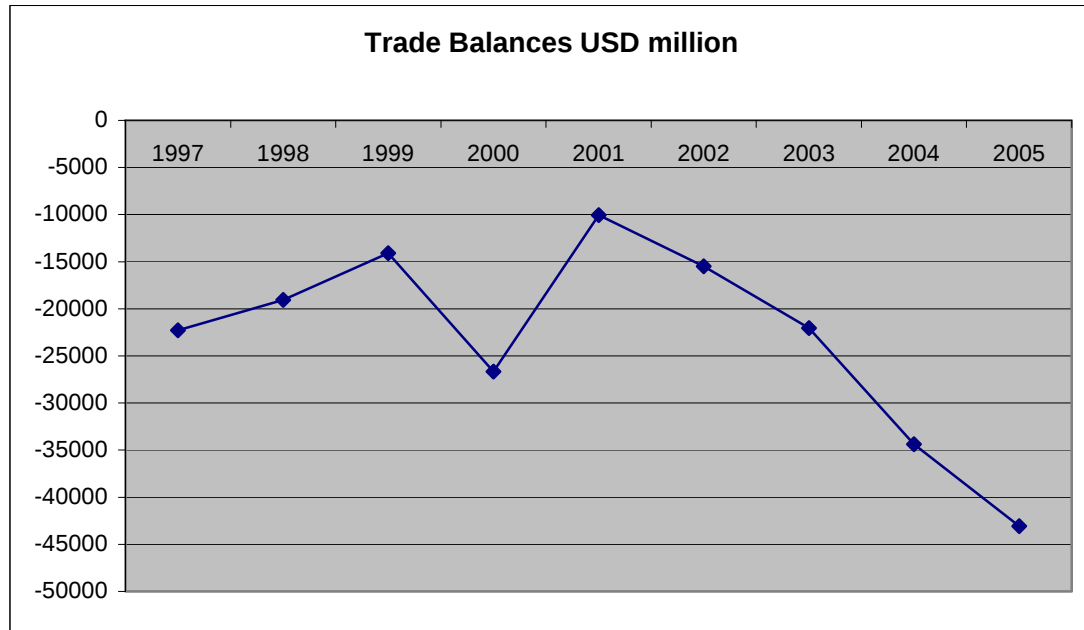


Figure 10. Trade Balance of Turkey

Source: State Planning Organization, Economic Indicators 2005

Additionally, current account deficit was \$15,604 million in 2004. With a 48% increase, it reached to the amount of \$23,091¹⁶ in 2005. The current account deficit reached 6.4% of GDP in 2005, boosted by the imported energy bill, which could increase by an estimated 1.5 percentage points of GDP for the year as a whole. Turkey had no difficulty in financing the large current account deficit and foreign reserves rose to the equivalent of 5.2 months of imports in 2005. However, short-term capital continues to be a significant part of these flows. Foreign direct investment (FDI) in 2005 has boomed and reached \$9.6 billion on a cash-flow basis (2.6% of GDP). This is a notable improvement compared to past performance, when FDI inflows remained compressed to less than 1% of GDP, despite strong worldwide growth.¹⁷

¹⁶ Turkish Central Bank, Database, 2006

¹⁷ World Bank, Country Economic Memorandum 2006

In 2001-06 period, the reserves of Central Bank has increased by 313% and moved from a total of \$18.7 billion in 2001 to \$58.6 billion (March 2006).

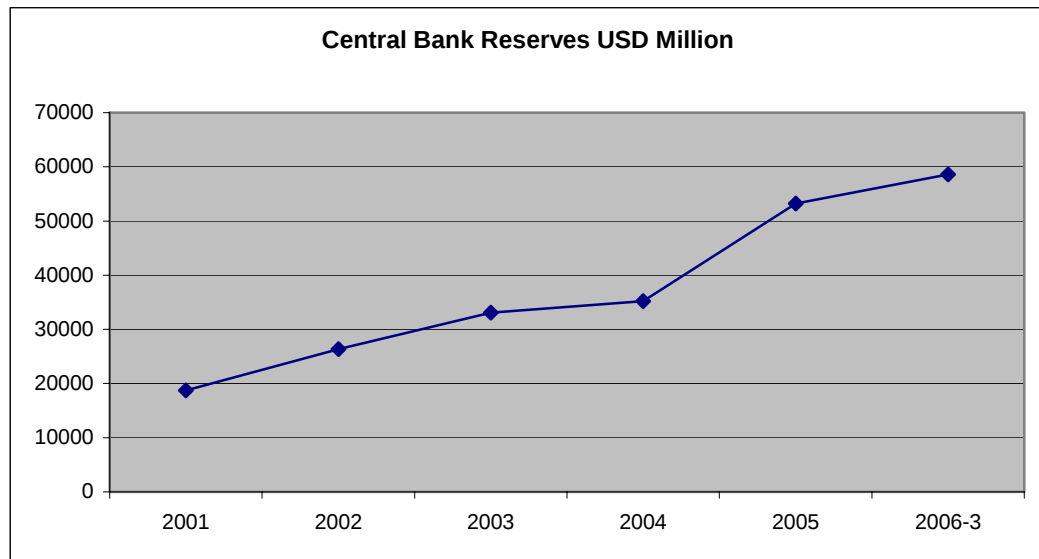


Figure 11. Turkish Central Bank Reserves

Source: Turkish Central Bank, Database 2006.

4.2. Brief Analysis of Government Spending

When Turkey was founded as a new country in 1923 by Mustafa Kemal Atatürk, the country was in a state of destruction. All the resources and capital was used in the independence war or there was a capital outflow. As a result, the new state found recovery by the government intervention in the economic affairs. This was called as State Control on the economy, and had been placed as one of the principles of Atatürk. The main idea was: The government would fill the gaps in the economy till it is filled by private enterprises. With this policy, the government produced sugar, salt, cement, iron, steel, aluminum, paper, oil components, meat, milk, clothing, chemicals, plastic, electric and etc. This policy has been actively used till the end of

1990s, when the privatization and the share of private enterprises and foreign capital fill the majority shares in Turkish economy.

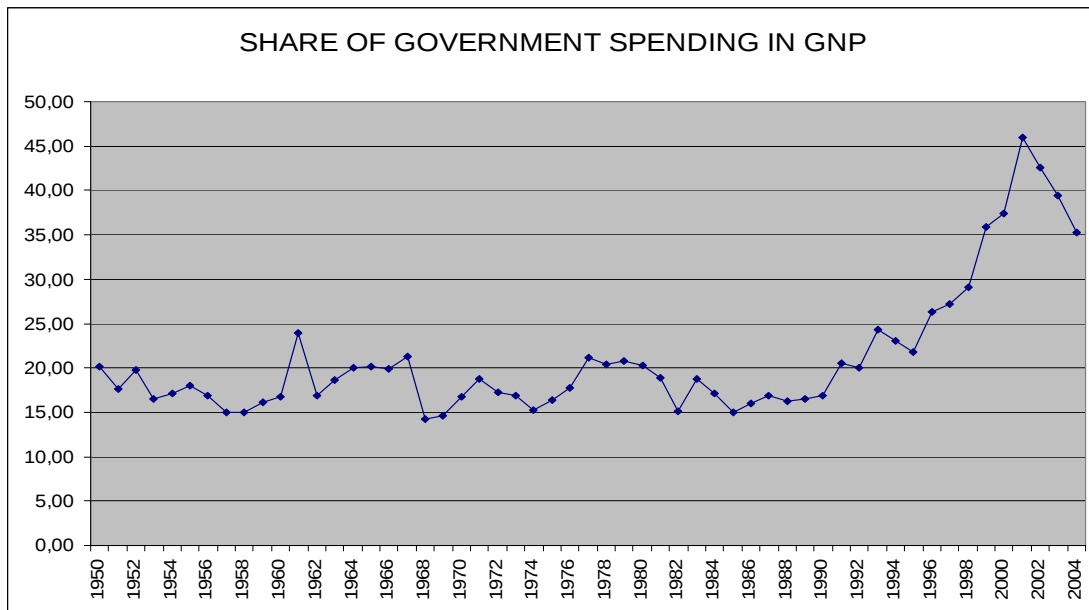


Figure 12. Share of Turkish Government Spending in GNP

Source: State Planning Organization, Economic Indicators 2005.

According to Figure 12, the share of government expenditures has filled a steady share in Turkish GNP till year 1993. From year 1950 to year 1993, the amount has varied between 14.19% (in 1968) to 23.95% (in 1961). The average share from 1950 to 1992 is 17.86%. The steady trend was broken in 1993 from 24.29% in that year, and reaching 46% in 2001. The year 2001 is the crisis year of Turkey. Huge current account deficit together with banking sector failures, have caused an above-expected crisis in the Turkish economy. It costs Turkey with a 46% government spending in GNP and a high cost foreign currency public debt. With the IMF assisted recovery program, Turkey

managed to reduce the share of government expenditure in GNP from 46.0% in 2001 to 35.29% in 2004¹⁸.

Government was the dominant factor from 1923 to 2001. The main idea was expansionary fiscal policy and direct state intervention in the economy in those years. After 2001 crisis, the fiscal policy changed radically. Since then, state has been applying a contractionary fiscal policy. This is the main reason for the declining share of government spending in GNP.

4.3. Analysis of Turkish Military Spending

Turkey has a geopolitically and geo-strategically important position in the Middle East region, which forces her to allocate huge amount of budget to dissuasiveness and defense requirements. The Middle East has been one of the World's most problematic areas. Although the general trend in the world is the reduction of defense budgets, average defense spending in the Middle East continues to increase.

Till the collapse of the Iron Curtain pact, Turkey was identified as the border country of NATO. Although both Turkey and Greece have been members of NATO, because of historical and positional reasons, both countries allocate huge amount of budget for arms procurement against each other. Distrustfulness and the awareness of high crisis risk in this region forces Turkey to form ready and strong armed forces.

¹⁸ It is noteworthy to state that the share of US's government spending in GNP is around 20% in 2005.

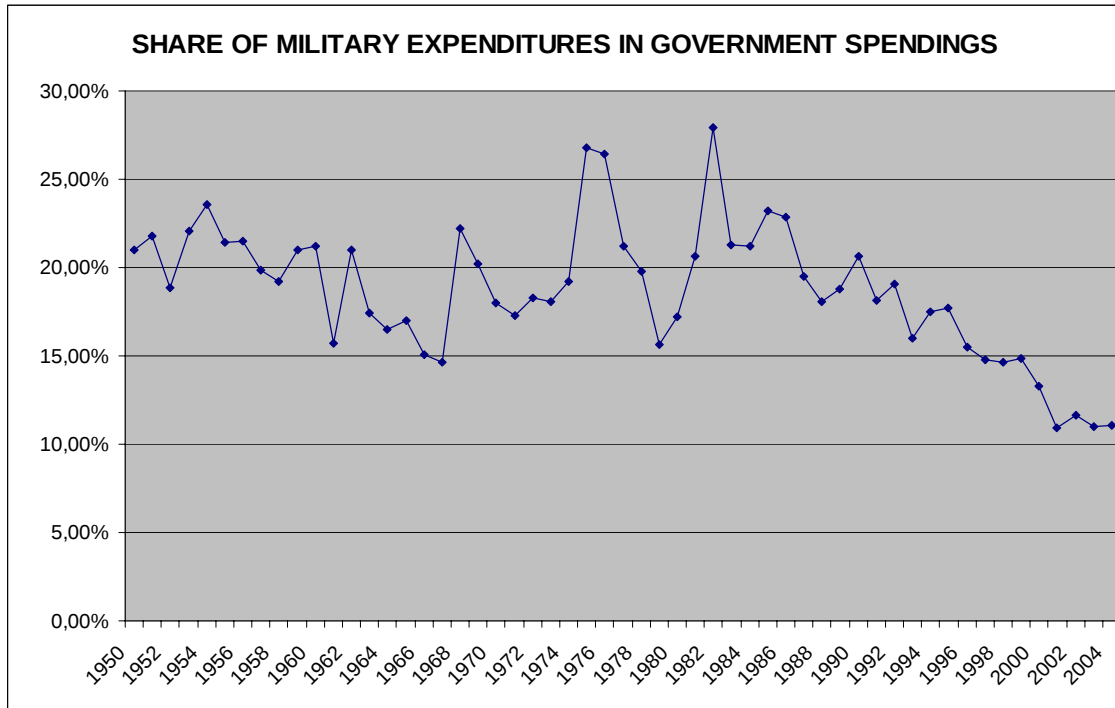


Figure 13. Share of Military Expenditures in Government Spending

Source: State Planning Organization, Economic Indicators 2005 and SIPRI 2005.

Data on military expenditures in Turkey is available since 1950. Three significant changes can be seen from the table above: the first one is in 1968, from 14.64% to 22.18%. The second one is in 1975, from 19.24% to 26.77%. And the last one is in 1982, from 15.63% in 1979 to 27.96% in 1982. The change from 1974 to 1975 can be explained by the Cyprus peace operation. The up straight movement from 1979 to 1982 can be explained by the military interference on September 12th, 1980 and military governance between 1980 and 1983. The period between 1967 and 1983 has a very highly cyclical character from the military expenditure shares point of view. From 1983 to 2004, the trend has a very methodical downfall. What is more, it can be concluded that, the share of defense spending has decided its optimal amount since 2001, and has a

parallel movement towards then. The share of military expenditures has been dispersed between 10.89% (in 2001) and 27.96% (in 1982).

As it is seen from the table that the years from 1984 to 2004, which has passed with the fight towards terrorism can be explained as the years that the military spending share has been steadily move downwards. This is contrary to the general belief that the fight with the terrorism has loaded a high military burden to the Turkish economy. As a result, the effect of the prevention of terrorism act will be analyzed in the empirical study.

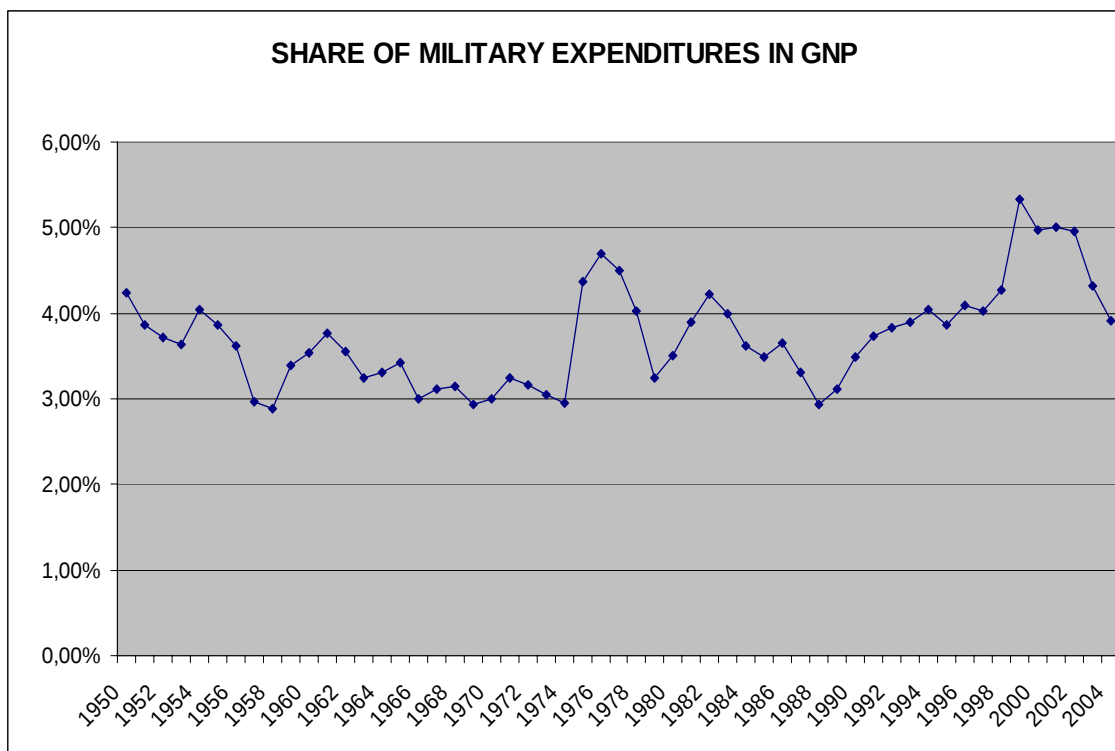


Figure 14. Share of Military Expenditures in GNP

Source: State Planning Organization, Economic Indicators 2005 and SIPRI 2005.

Military spending has comprised on average 3.73% of GNP. Even though, the share has been dispersed between 2.88% in 1958 to 5.32% in 1999. The trend is steady between the period 1950 – 2004. The trend can be better understood when it is studied together with the overall government expenditures' share in GNP.

4.3.1. Turkish Military Spending Trend

Turkey has managed a successful fiscal program since 2001. The fiscal program, which was assisted by International Monetary Foundation (IMF), has been based on strict fiscal discipline. As mentioned before, she has reduced budget deficits and as a result reduced the real government debts. Parallel to this, military spending has been in a downward trend since 1999. The military spending trend was also affected from the fiscal discipline started in 2001.

Turkey ranked 14th in Stockholm International Peace Research Institute's (SIPRI) "Major Spender Countries List" with a spending of \$10.1 billion and a share of around 1% of world military spending. When her spending was calculated with the purchasing power parity (PPP), Turkey ranked 11th in the same list.

On the other hand, a decreasing trend in Turkish military expenditure is analyzed since 1999. Both in dollar amount and GDP percentage, military spending has been decreased since 1999. It can be said that, Turkish military spending has a parallel trend in dollar terms starting from 2001. In 2004, because of the high GDP growth, the percentage was dropped to 3,9%.

Military expenditure in constant (2003) US\$ m.								
<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>
10008	10427	10926	12064	11675	10703	11388	10278	10142
Military expenditure as percentage of gross domestic product								
<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>
4,1	4,1	4,4	5,4	5	5	4,9	4,9	3,9

Table 1. Military Expenditures of Turkey

Source: SIPRI Yearbook 2005, Armaments, Disarmament and International Security.

Military expenditure in MER dollar terms						Military expenditure in PPP dollar terms		
Rank	Country	Spending (\$ b.)	Spending Per Capita (\$)	World share (%)	Population	Rank	Country	Spending
1	USA	455,3	1533	47	5	1	USA	455,3
2	UK	47,4	798	5	1	2	China	161,1
3	France	46,2	764	5	1	3	India	81,8
4	Japan	42,4	332	4	2	4	Russia	66,1
5	China	35,4	27	4	21	5	France	51,2
Sub-total, top 5		626,7		64	29	Sub-total, top 5		815,6
6	Germany	33,9	411	3	1	6	UK	46,2
7	Italy	27,8	484	3	1	7	Germany	36,9
8	Russia	19,4	136	2	2	8	Japan	35,2
9	Saudi Arabia	19,3	775	2	0	9	Italy	34,5
10	Korea, South	15,5	323	2	1	10	Saudi Arabia	29,1
Sub-total, top 10		742,5		76	35	Sub-total, top 10		997,4
11	India	15,1	14	2	17	11	Turkey	24,3
12	Israel	10,7	1627	1	0	12	Korea, South	23,1
13	Canada	10,6	336	1	1	13	Brazil	20,7
14	Turkey	10,1	140	1	1	14	Iran	18,5
15	Australia	10,1	507	1	0	15	Pakistan	16,1
Sub-total, top 15		799,2		82	54	Sub-total, top 15		100,2

Table 2. Major Spender Countries

Source: SIPRI Yearbook 2005, Armaments, Disarmament and International Security.

4.3.2. Major Spender Countries In 2004

The fifteen major spender countries spent about 82% of world military spending in 2004. What is more, the top 5 countries account for about 64% of the total. The total spending of the major spenders is \$800 billion, more than two times the Turkish GNP.

The highest spender –USA- spent nearly ten times more on defense requirements than the second highest spender –UK. It is noteworthy to state that USA spent around 23 times more on defense than her ex-competitor Russia.

Even though Turkey still keeps the developing country status with its accelerating economic performance, large trade and current account deficits, it still allocates a significant part of its resources for defense. Moreover, Turkey is also one of the leading arms importing countries in the world. Turkish defense spending shows some important characteristics.

Although Turkish defense spending has a significant share in the Turkish economy, the demand for defense spending has not been extensively investigated. To my knowledge, there is one study by Sezgin & Yıldırım (2002), which presents an analysis of the determinants of the demand for Turkish military expenditure for the period 1949–1998, employing ARDL model approach to cointegration. They argued that the level of military expenditure is determined by five major factors: the influence of external conflicts; the requirements of internal security; domestic bureaucratic and budgetary factors; the influence of the armed forces themselves; the role of the major factors such as military coups, regimes and arms sales.

These factors are all political and security related. Although political and military influences are quite important, the most crucial and central determinants of defense expenditure is budgetary, financial and resource constraints.

In their study they found that Turkish defense expenditure is mainly determined by the defense expenditure of the allies (NATO) and that of enemies (Greece) in the short run.

However Greek defense spending does not have any significant effect on Turkish demand for defense spending in the long run, contrary to the spending of NATO. These results suggest that Turkey is in the follower mode considering the NATO defense expenditure and there does not seem to be an arms race or rivalry between Turkey and Greece in the long run. However, in the short-run, there may be an arms race between the two countries due to the Cyprus conflict. Moreover, the short-run estimates have a significant and high adjustment coefficient, indicating that economy quickly returns to its equilibrium level, once shocked. (see Sezgin & Yildirim, 2002)

4.3.3. Global Trends In Military Expenditures

Overall world military spending in 2003 was increased by approximately 11% in real terms due to Iraq war, and increased terror. What is more, it was preceded by an increase of 6.5 per cent in 2002. In two years time, overall world military spending increased by around 18%, to reach \$956 billion in 2003.

Skons, Perdomo, Perlo-Freeman and Stalenheim (2004) analyzed the recent trends as follows:

“High-income countries account for about 75% of world military spending but only 16 per cent of world population. The combined military spending of these countries was slightly higher than the aggregate foreign debt of all low-income countries and 10 times higher than their combined levels of official development assistance in 2001. While it is not possible, because of a lack of data, to make the same comparison for 2003, it is clear that these gaps have widened owing to the stark rise in world military expenditure since

2001. Thus, there is a large gap between what countries are prepared to allocate for military means to provide security and maintain their global and regional power status, on the one hand, and to alleviate poverty and promote economic development, on the other.

The main reason for the increase in world military spending is the massive increase in the United States, which accounts for almost half of the world total. After a decade of reductions in military expenditure in the period 1987–98 and moderate increases in 1998–2001, the changes in US military doctrine and strategy after the terrorist attacks of 11 September 2001 unleashed huge increases in US military spending in 2002 and 2003. Much of the rise is accounted for by the large supplementary appropriations to cover the costs of the military operations in Afghanistan and Iraq and of anti-terrorist activities. In the absence of these appropriations, US military expenditure would still show a significant increase, but at a much slower rate, and world military spending would show a rise of 4 percent rather than 11 percent in 2003. While military expenditure is also rising in several other major countries, these increases are much smaller, and there is little indication that the strong increase in US military spending is resulting in an equally strong tendency for other countries to follow suit. It is difficult to assess the importance of US influence relative to more basic drivers of military spending, such as changing threat perceptions, increased global responsibilities and force projection, and the dynamics of military technology—in particular, since these factors are often strongly interlinked with the relevant countries' relations with the USA.

While all countries accept that no nation is currently able to match the USA in military power, there are other types of response that could impact on their military spending. A

review of military expenditure trends in seven other major spenders shows that military expenditure has risen in most years of the five-year period 1999–2003 in all seven countries. India and Japan have raised their military spending in line with their GDP growth. Apart from the two years 2001 and 2002, the same is true for China. In France and the UK, the military burden declined slightly in recent years, but in France it began to rise in 2003 and the burden is planned to increase in the UK. Brazil, unlike other medium-rank powers, is pursuing global influence using a model of ‘soft power’ rather than increased military expenditure. Its comfortable strategic position and enhanced trading relations have allowed a reallocation of scarce resources to economic and social development.

During most of 2003, much of the focus in national military spending debates continued to be on the need to increase military spending to meet increasing dangers and risks in an increasingly complex and globalized world. However, towards the end of the year and in early 2004, there were several indications that other factors, related to the economic burden of the military sector and to ethical considerations, tended to increase in importance in several countries. In particular, the US doctrine of pre-emptive wars was being challenged on both ethical and international law grounds, as well as because of the large costs and dubious successes associated with it. Thus, while US military expenditure is set to continue to grow and will continue to propel world military spending, the pace is likely to fall back somewhat in the next few years. In the longer term it is doubtful whether current levels will be economically and politically sustainable.

On the other hand, military expenditure in the Middle East increased by almost 10 per cent in 2003. Mainly two countries that share contiguous borders with Iraq caused the increase: Iran and Kuwait. Saudi Arabia, the region's biggest spender, increased its military expenditure only marginally. Israel, the region's strongest military power, made a major policy decision in the light of events in Iraq to cut its military spending. Factors accounting for the limited impact of the war on military expenditure in the region include the non-participation of many of the states in the war, the unpopularity of the war among the populations in the region, and their limited absorptive capacities for additional military equipment. Internal security is increasingly becoming a preoccupation of many states in the region because of the restiveness of their populations."

CHAPTER 5

THE MODEL AND DATA

5.1. The Model

Though there is no general agreement on the effects increased defense spending has on economic development in general, and growth rate in particular, there is a general agreement among researchers that: (a) defense spending can potentially affect economic growth either directly through increased capacity utilization caused by Keynesian-type demand effects, the modernization of outlook, and technological spin-off, or indirectly through such channels as increased supply of skilled and managerial personnel to the economy; (b) economic growth rate, defense spending, and investment are determined separately.

As Gyimah-Brempong (1989) states, any reasonable econometric model of the defense spending – economic growth relationship should therefore allow for:

- i. Direct effect of defense spending on economic growth,
- ii. Indirect effect through capital formation, skilled labor supply, and other externalities, and
- iii. Allow for the endogeneity of defense spending, economic growth, and the supply of skilled labor.

Defense spending will influence economic growth in many ways. First, it is likely to influence growth through its impact on aggregate demand. As Keynesian analysis suggests, if aggregate demand is low relative to potential supply, increased defense

spending could lead to increased utilization of capacity. In addition to the short-term multiplier effects, such increased demand could lead to long-term economic growth since it leads to increased profit rate; hence investment and growth. However, this Keynesian-type demand effect is possible if defense spending is autonomous.

A second way defense spending can influence economic growth is the creation of additional resources or improving the quality of existing resources. One of the scarce resources in Turkey is skilled personnel. Benoit (1978) has argued that military training provides an easy way to increase a nation's stock of managerial and technical skills. If defense spending increases the supply of such skills in an economy, it will increase economic growth indirectly through this supply of skills.

Another resource that is influenced by defense spending is capital. Defense spending can crowd out investment in either productive capital or infrastructure, especially in LDCs where both private and public resources are extremely scarce. For any given amount of savings, the more that is devoted to defense, the less will be available for investment.

The foregoing implies that economic growth will depend on defense spending, skilled labor, investment, and technology. However, these variables are not independent of each other. Most of these variables are endogenous.

In this study, the defense – growth model à la Gyimah–Brempong (1989) is used. It is assumed that output (Y) is a function of capital (K), labor (L), defense (M), and technology (T). Formally:

$$(1) \quad Y = F(K, L, M, T)$$

where Y = Gross Domestic Product (GDP), K = Gross fixed investment, L = skilled labor, M = defense expenditure, and T = technological progress.

Taking the growth rates of the same variables, eqⁿ (1) becomes:

$$(2) \quad y = f(k, l, m, t)$$

where lower-case letters refer to growth rates of the variables defined above.

Investment is not independent of other variables in eqⁿ (2). The rate of capital formation is expected to be positively correlated with the level of output given the incremental capital-output ratio. Second, given any amount of resources, if a larger share is devoted to defense, there will be a smaller share left for all other things, including capital formation. On the other hand, it is hypothesized that increased security brought about by increased defense spending, all things equal, fosters optimism in the business community, leading to increased capital formation. In view of these possibilities, the following capital growth formulation is postulated:

$$(3) \quad k = k(y, m, Z_k)$$

where Z_k is a vector of exogenous variables that influence investment growth.

Benoit (1973, 1978), Weede (1986), and other researchers have argued that military training provides technical and managerial skills that are then imparted to the civilian economy. It is possible that increased defense spending will increase the supply of skilled personnel. However, increased defense spending could crowd out expenditure on education, leading to a reduction in the supply of skilled personnel to the economy. The net effect of these conflicting results cannot be determined theoretically. It is an empirical question to be determined. To allow for this possibility, it is postulated that:

$$(4) \quad l = l(m, Z_l)$$

where Z_l is a vector of exogenous variables that influence growth of skilled labor.

Finally, defense spending does not only depend on security related factors, but on the ability to pay as well, and hence on the growth rate of the economy.

$$(5) \quad m = m(y, Z_m)$$

where Z_m is a vector of exogenous variables that influence defense spending. Equations (2), (3), (4), and (5) form the system of equations to be estimated.

Estimation of the system of equations requires us to provide specific functional forms for these equations and specify all the variables in the equation system. Economic theory does not provide any guide to the functional form for any of these equations. Hence, a linear (in parameters as well as variables) specification for the system of equations is chosen. The full equation system to be estimated is specified below:

$$(2b) \quad y = a_0 + a_1 k + a_2 l + a_3 m + a_4 XG + a_5 CRS + a_6 TECH$$

$$(3b) \quad k = b_0 + b_1 m + b_2 y + b_3 DEP + b_4 TB + b_5 INF$$

$$(4b) \quad l = c_0 + c_1 m + c_2 EDUX + c_3 SECED$$

$$(5b) \quad m = d_0 + d_1 y + d_2 COUP + d_3 GOVX + d_4 TERR$$

where:

y: annual growth rate of real GDP.

k: annual growth rate of real gross fixed investment.

m: annual growth rate of real defense spending.

l: annual growth rate of skilled labor amount. Skilled labor is the gross labor force excluding agricultural labor force.

XG: annual growth rate of real export earnings.

TECH: Technology. Annual electricity consumption is used as a proxy for the level of technology.

CRS: economic crisis dummy, = 1 for the years 1980, 1994, 1999, and 2001.

DEP: annual growth rate of total real deposits amount.

TB: annual growth rate of real trade balance.

INF: annual inflation rate.

EDUX: annual growth rate of government expenditure on primary and secondary education.

SECED: annual growth rate of the amount of students in secondary education.

COUP: military coup dummy, = 1 for the years 1980, 1981, and 1982.

GOVX: annual growth rate of real government expenditures.

TERR: the prevention of terrorism act dummy, = 1 for the years beginning 1984.

The growth equation (2b) includes the growth of export earnings (XG) and economic crisis (CRS) among other variables. Given the openness of Turkish economy and the dependence on export earnings, growth of export earnings is believed to be important in determining the growth rate of GDP. Since Turkish economy is very sensitive and responsive to economic crisis, crisis dummy is argued to be greatly influences industrial production in Turkey, but not part of the growth accounting identity.

Annual electricity consumption (TECH) is included in the empirical model to represent technological growth for lack of a better formulation of technical progress. The coefficients of k , l , XG, and TECH are expected to be positive. The coefficient of CRS is expected to be negative. However, the coefficient of the growth of real defense spending (m) cannot be signed a priori (Gyimah-Brempong, 1989).

The growth rate of gross fixed investment (k) equation (3b) includes m, y, DEP, TB, and INF as regressors. Higher growth of gross income implies that there is more of GDP available for reinvestment. Also, total real deposits is included to show its positive effect on capital growth. The growth rate of trade deficit is also included to show the effects on investment. Turkey has had high inflation through most of 1980 – 2004 period. Inflation ratio is believed to affect negatively on the investment rate. y, and DEP are expected to have positive whereas INF is expected to have negative coefficients in the k equation. However, the coefficients of m, and TB cannot be signed a priori.

The growth of skilled labor equation (4b) includes the growth rate of real government expenditure on education (EDUX), and the growth rate of the amount of students in secondary education. The higher the growth rate of public education expenditures, the higher the growth rate of population that is educated, and all things equal, is the growth rate of skilled personnel. It is also assumed that secondary education is an important aspect in skilled labor formation. If the Benoit hypothesis that military training imparts skilled personnel to the civilian economy is correct, then m is expected to have a positive coefficient together with EDUX and SECED.

The growth of defense spending equation (5b) includes two resource variables – y and GOVX – two domestic security and order related dummy variables – COUP and TERR. Output growth (y) variable is intended to test whether higher gross income will lead to higher defense spending. On the other hand government expenditures (GOVX) is a factor of Domestic income, but is the main source of defense budget. As a result an increase in government spending is expected to make a positive effect on military expenditures. The coup variable is intended to test the hypothesis that a successful coup leads to increased rate of defense spending. The last variable is TERR, which is intended

to test whether the fight with terrorism since 1984 has positive effects on the defense spending or not. All of these coefficients y , $GOVX$, $COUP$, and $TERR$ are expected to be positive.

The total effect of defense spending on economic growth is the sum of the direct effect on economic growth and indirect effects through channels in investment and availability of skilled labor. Formally:

$$(6) \quad dy / dm = \partial y / \partial m + (\partial y / \partial k) (\partial k / \partial m) + (\partial y / \partial l) (\partial l / \partial m)$$

The sign of dy/dm depends upon the signs and magnitudes of the three expressions on the right-hand side of (6). Even if $\partial y / \partial m > 0$, the sign of dy/dm is still indeterminate. Assuming that $\partial y / \partial k, \partial y / \partial l \geq 0$, either $\partial k / \partial m$, or $\partial l / \partial m$ or both can be positive or negative, leaving the sign of dy/dm , and indeterminate. The sign of dy/dm , and hence the effects of defense spending on economic growth, is therefore an empirical question.

5.2. Data

5.2.1 Military Expenditure Data

Military expenditure data of Turkey from 1950 to 2004 is available in Stockholm International Peace Research Institute (SIPRI) database. The data used in this paper (1980 – 2004) is extracted from various issues of SIPRI year books. SIPRI data reflects the official data reported by governments. In order for the reader to judge the accuracy and reliability of military data, explanation of SIPRI about the sources, definition of military expenditure, and methods is reflected in Appendix A.

5.2.2 Other Data

Data used in this study except military spending data has been gathered from State Planning Organization (SPO) and Turkish Statistical Institution (TSI). According to Sen (1995), using constant values is problematic because of the inadequate comparability of annual figures because of the effect of inflation. Thus, all data are converted to 1987 prices to acquire real figures. Some data definitions are stated below:

EDUX: Annual growth rate of government expenditure covers the expenditures of Ministry of Education. The values exclude the expenditures of the Council of Higher Education. Source: State Planning Organization (SPO).

l: Annual growth rate of skilled labor amount. Skilled labor is the gross labor force excluding agricultural labor force. The values are obtained by subtracting agricultural labor force from the total labor force. Source: SPO.

All data refer to the 1980-2004 period because 1980 is the first year for many categories of data that are available. All data are outlays in calendar years.

CHAPTER 6

RESULTS

6.1. Regression Results

By using data from 1980 to 2004, the four equations are estimated using the two-stage least squares (2SLS) estimation procedure¹⁹. The results of the estimations are presented below:

$$y = 0.0199 + 0.164 k + 0.137 l + 0.045 m + 0.01 XG - 0.064 CRS + 0.235 TECH$$

(1.37)* (3.71) (0.66) (0.91) (0.47) (-3.81) (1.40)

$$R^2 = 0.88$$

$$F \text{ statistic} = 21.03$$

$$k = -0.06 - 0.17 m + 2.17 y + 0.076 DEP + 0.01 TB + 0.02 INF$$

(-1.05) (-0.79) (4.68) (0.55) (0.20) . (0.24)

¹⁹ Two-stage least squares regression (2SLS) is a method of extending regression to cover models which violate ordinary least squares (OLS) regression's assumption of recursivity, specifically models where the researcher must assume that the disturbance term of the dependent variable is correlated with the cause(s) of the independent variable(s). Second, 2SLS is used for the same purpose to extend path analysis, except that in path models there may be multiple endogenous variables rather than a single dependent variable. Third, 2SLS is an alternative to maximum likelihood estimation (MLE) in estimating path parameters of non-recursive models with correlated error among the endogenous variables in structural equation modeling (SEM). Fourth, 2SLS can be used to test for selection bias in quasi-experimental studies involving a treatment group and a comparison group, in order to reject the hypothesis that self-selection or other forms of selection into the two groups accounts for differences in the dependent variable.

$$R^2 = 0.68$$

$$F \text{ statistic} = 7.91$$

$$l = 0.023 + 0.014 m - 0.0015 \text{ EDUX} + 0.079 \text{ SECED}$$

$$(4.68)^* \quad (0.25) \quad (-0.07) \quad (1.72)$$

$$R^2 = 0.14$$

$$F \text{ statistic} = 1.09$$

$$m = -0.138 + 0.329 y + 0.272 \text{ COUP} + 0.367 \text{ GOVX} + 0.138 \text{ TERR}$$

$$(-1.61) \quad (1.02) \quad (2.71) \quad (2.56) \quad (1.70)$$

$$R^2 = 0.36$$

$$F \text{ statistic} = 2.85$$

(*) Absolute values of t statistics in parenthesis

In the GDP growth equation, only the coefficient of investment growth, is positive and significantly different from zero at the 0.001 significance level. Crisis has a negative and statistically significant coefficient at the 0.001 significance level. Military spending growth, export earnings growth, technology and skilled labor growth have positive but statistically insignificant coefficient. The positive but insignificant coefficient of growth rate of real defense spending (m) implies that it does not have any direct effect on economic growth in Turkey. This result is plausible since there is no lack of demand, but the problem is supply bottlenecks in Turkish economy.

In the investment growth equation, only the coefficient of GDP growth is statistically significant at 0.001 level and has a positive sign. This result shows that the investment amount and domestic income are correlated and move together. A rise in one of them triggers a positive movement on the other. The coefficients of inflation rate, total deposits growth, trade balance growth and military expenditure growth are statistically insignificant at any reasonable rate. However, the signs of the coefficients are as expected; military expenditure growth has negative coefficient in the investment growth equation, whereas total deposits growth and trade balance growth has positive. On the other hand, contrary to expectations, inflation rate has a positive sign. The negative effect of defense spending on investment may be caused by resource drainage and this effect outweighs any positive influence that defense spending act on investment.

In the skilled labor growth equation, only the coefficient of students in secondary education growth is statistically significant at the 0.10 level with a positive sign. This shows that, the higher the students have secondary education, the more the availability of skilled labor. On the other side, the coefficients of military spending growth and public education expenditures growth are not statistically significant at any reasonable level. However, although it is not significant, the positive sign of military spending coefficient shows the positive effect military training has on skilled labor formation as it is estimated a priori. This result is consistent with Benoit thesis that defense spending positively affects the availability of skilled labor to the economy. However, the result is not parallel to Değer's (1985) conclusion that military spending is negatively influencing skill formation.

In the military spending growth equation, the coefficients of terror dummy variable, military coup dummy variable, and growth of total government expenditures have positive signs and statistically different from zero at least at the 0.10 significance level. The positive and statistically significant coefficient of growth of total government expenditures shows that military spending is dependent on the limitations of government expenditures and an increase in government expenditures triggers an increase in defense spending. The positive coefficient of terror reflects the effect of burden from the prevention of terrorism act. Also the positive coefficient of coup variable shows that the military coup periods increase military spending. However, the growth rate of GDP has a positive but insignificant coefficient. This may be interpreted as, military spending is independent from economic growth and not influenced at least in the short run.

What is surprising is the fact that none of the military spending coefficients in any equation is statistically significant. This means that military spending does not directly affect any of GDP growth, investment growth or skilled labor growth.

Gyimah-Brempong (1989) states the total effect of military spending – both direct and indirect effects – on growth rate of the economy as:

$$\begin{aligned} dy / dm &= \partial y / \partial m + (\partial y / \partial k) (\partial k / \partial m) + (\partial y / \partial l) (\partial l / \partial m) \\ &= [a_1 b_1 + a_2 c_1 + a_3] / [1 - a_1 b_2 - a_3 d_1] \end{aligned}$$

In order to calculate this multiplier, one needs to use statistically significant coefficients. In this equation, only a_1 (coefficient of annual investment growth in the GDP growth equation) and b_2 (coefficient of GDP growth in the investment growth equation) is

statistically different from zero at any reasonable significance level. And as it is stated before, none of military coefficients (a_3 , b_1 , c_1) is statistically significant. **There is not a statistically significant multiplier effect of defense spending on Turkish economy – directly or indirectly.**

This conclusion is consistent with the results obtained by Biswas & Ram (1986), Alexander (1990), Huang & Mintz (1991), Dakurah et al. (2001), Heo & Hahm (2004), Özsoy (2000), and Kelly & Rishi (2003) among others, who find no significant relationship between defense spending and economic growth.

However, if the multiplier is calculated using insignificant coefficients, an average effect of 0.031 can be obtained. As a result of this fact, 1 percent increase in military expenditures results in a 0.03 percent (not statistically significant) increase in GDP. This result indicates that the total effect of defense spending on economic growth – though it is not statistically significant – is positive.

This positive effect is partly consistent with the results obtained by Benoit (1973, 1978), Frederiksen & Looney (1983), Weede (1986), De Grasse (1983), Ram (1986), Ateşoğlu & Mueller (1990), Ward et al. (1991), Dunne & Nikolaidou (2001), Sezgin (1997; 1999; 2001), Yıldırım and Sezgin (2002), Candar (2003), Halıcıoğlu (2004), and Sezgin, Yıldırım and Öcal (2005) among others, who find a positive relationship between defense spending and economic growth.

However, it is not consistent with the results obtained by Smith (1977, 1980), Değer & Smith (1983), Lim (1983), Değer & Sen (1983), Nabe (1983), Faini, Annez & Taylor (1984), Değer (1986), Lebovic and Ishaq (1987), Rasler and Thomson (1998), DeRouen

(2000), Sezgin (2000), Abu-Bader & Abu-Qarn (2003), and Galvin (2003) among others, who find a negative relationship between defense spending and economic growth.

CHAPTER 7

CONCLUSION

This study presents an analysis of the relationship between Turkish military spending and economic development for the time period 1980 – 2004, using a four-equation econometric model and two-stage least squares estimation method. The conclusions from the econometric analysis are that:

- i. There is not a statistically significant multiplier effect of defense spending on economic growth. This means that there is no relationship between defense spending and economic growth in Turkey.
- ii. There is an insignificant military spending multiplier of +0,031. The total effect of defense spending is positive on Turkish economic growth.
- iii. As a result of this fact, 1 percent increase in military expenditures results in a 0.03 percent (not statistically significant) increase in GDP.
- iv. The effects of military spending on investment and skilled labor formation are also insignificant.
- v. Defense spending is mainly shaped by the total government expenditures, the prevention of terrorism act, military coups and other non-economic factors.

The conclusion from this study is consistent with those of studies that have found no relationship and partly consistent with those who have found positive relationship between defense spending and economic growth.

Different methods of estimation for simultaneous-equation models have been proposed in the literature. These can be classified under the category of single-equation methods (alternatively called full-information methods) and system methods (alternatively called full-information methods), (see Maddala, 1977). In single equation methods, each equation is estimated separately using only the information about restrictions on the coefficients of that particular equation. The restrictions on the coefficients of the other equations are not used. They are (or should be) used to check the identifiability of the particular equation. But they are not used for estimation purposes. This is the reason these methods are called limited-information methods. In system methods, all equations are estimated jointly using the restrictions on the parameters of all the equations as well as the variances and covariances of the residuals. This is the reason they are called full-information methods. Two-stage least squares method, which is used in this study, is the most commonly used single-equation estimation technique.

This study used two-stage least squares (2SLS) estimation method due to limited information. On the other hand, the four equations in this study may give more satisfactory results if they are estimated simultaneously. Because of the intercorrelations among the equations, error terms are likely to be correlated across equations. In order to comprise in the account of correlation of error terms across equations, the three-stage least squares (3SLS) estimation procedure may be a better alternative to estimate the

system, which is a full-information method. This may be a fruitful avenue for further studies.

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APPENDIX A

SIPRI MILITARY EXPENDITURES DATA

1. Sources²⁰

The sources for military expenditure data are, in order of priority: (a) primary sources, that is, official data provided by national governments, either in their official publications or in response to questionnaires; (b) secondary sources which quote primary data; and (c) other secondary sources.

The first category consists of national budget documents, defence white papers and public finance statistics published by ministries of finance and of defence, central banks and national statistical offices. It also includes government responses to questionnaires about military expenditure sent out by SIPRI, the United Nations or the Organization for Security and Co-operation in Europe (OSCE).

The second category includes international statistics, such as those produced by NATO and the International Monetary Fund (IMF). Data for NATO countries are taken from NATO defence expenditure statistics as published in a number of NATO sources. Data for many developing countries are taken from the IMF's Government Financial Statistics Yearbook, which provides a defence line for most of its member countries. This category also includes the publications of other organizations which provide proper

²⁰ SIPRI year book, 2005

references to the primary sources used. The three main sources in this category are the Europa Yearbook (Europa Publications Ltd, London), Country Reports of the Economist Intelligence Unit (London), and Country Reports by IMF staff.

The third category of sources consists of specialist journals and newspapers.

2. Definition of military expenditure

Although the lack of sufficiently detailed data makes it difficult to apply a common definition of military expenditure on a worldwide basis, SIPRI has adopted a definition, based on the NATO definition, as a guideline. Where possible, SIPRI military expenditure data include all current and capital expenditure on: (a) the armed forces, including peacekeeping forces; (b) defence ministries and other government agencies engaged in defence projects; (c) paramilitary forces, when judged to be trained and equipped for military operations; and (d) military space activities. Such expenditures should include: (a) military and civil personnel, including retirement pensions of military personnel and social services for personnel; (b) operations and maintenance; (c) procurement; (d) military research and development; and (e) military aid (in the military expenditure of the donor country). Civil defence and current expenditures on previous military activities, such as veterans' benefits, demobilization, conversion and weapon destruction are excluded.

In practice it is not possible to apply this definition for all countries, since this would require much more detailed information than is available about what is included in

military budgets and off-budget military expenditure items. In many cases SIPRI cannot make independent estimates but is confined to using the national data provided. Priority is then given to the choice of a uniform definition over time for each country in order to achieve consistency over time, rather than to adjusting the figures for single years according to a common definition. In cases where it is impossible to use the same source and definition for all years, the percentage change between years in the deviant source is applied to the existing series in order to make the trend as accurate as possible. In the light of these difficulties, military expenditure data are not suitable for close comparison between individual countries and are more appropriately used for comparisons over time.

3. Methods

SIPRI data reflects the official data reported by governments. As a general rule, SIPRI takes national data to be accurate until there is convincing information to the contrary. Estimates are made primarily when the coverage of official data does not correspond to the SIPRI definition or when there are no consistent time series available. In the first case, estimates are made on the basis of an analysis of official government budget and expenditure accounts. The most comprehensive estimates, for China and Russia, have been presented in detail in previous Yearbooks. In the second case, differing time series are linked together. In order not to introduce assumptions into the military expenditure statistics, estimates are always based on empirical evidence and never based on assumptions nor extrapolations. Thus, no estimates are made for countries which do not release any official data. These countries are displayed without figures. (SIPRI, 2005)

APPENDIX B

THE DATA SET

	y*	m	GOVX	TERR	TB
YEAR	GDP GROWTH	MILITARY EXP. GROWTH	GOVERNMENT EXP. GROWTH	THE PREVENTION OF TERRORISM ACT	TRADE BALANCE GROWTH
1980	-2,45%	4,97%	-4,71%	0	90,09%
1981	4,86%	16,82%	-2,63%	0	-15,00%
1982	3,56%	11,47%	-17,63%	0	-16,71%
1983	4,97%	-1,32%	29,46%	0	25,13%
1984	6,71%	-2,90%	-2,49%	1	13,27%
1985	4,24%	0,59%	-8,17%	1	-13,18%
1986	7,01%	11,52%	13,32%	1	2,61%
1987	9,49%	-0,65%	16,50%	1	4,10%
1988	2,12%	-9,87%	-2,52%	1	-34,08%
1989	0,25%	7,65%	3,23%	1	32,62%
1990	9,26%	22,88%	12,02%	1	74,85%
1991	0,93%	7,19%	21,80%	1	-19,92%
1992	5,98%	9,42%	4,08%	1	10,36%
1993	8,04%	9,73%	30,80%	1	64,93%
1994	-5,46%	-2,53%	-10,77%	1	-52,21%
1995	7,19%	3,12%	1,87%	1	124,30%
1996	7,01%	13,47%	29,39%	1	44,59%
1997	7,53%	6,67%	11,91%	1	12,48%
1998	3,09%	10,37%	11,36%	1	-16,73%
1999	-4,71%	16,91%	15,62%	1	-23,38%
2000	7,36%	-0,64%	10,81%	1	87,98%
2001	-7,50%	-8,87%	11,26%	1	-52,54%
2002	7,94%	6,83%	0,02%	1	31,36%
2003	5,79%	-7,68%	-2,19%	1	15,79%
2004	8,93%	-0,47%	-1,55%	1	35,13%

SOURCE: SIS, SPO

* see page 60 and 61 for the definition of variable abbreviations.

	XG	EDUX	TECH	CRS	COUP
YEAR	EXPORT EARNINGS GROWTH	EDUCATION EXP. GROWTH	ELECTRICITY CONSUMPTION GROWTH	CRISIS YEARS	MILITARY COUP PERIODS
1980	37,42%	5,56%	4,93%	1	1
1981	62,34%	16,18%	6,77%	0	1
1982	39,02%	-1,39%	7,07%	0	1
1983	10,14%	21,98%	3,72%	0	0
1984	36,54%	-20,45%	12,96%	0	0
1985	3,66%	-10,70%	7,50%	0	0
1986	-10,78%	-1,39%	8,42%	0	0
1987	30,79%	12,54%	13,93%	0	0
1988	11,97%	13,72%	8,24%	0	0
1989	-15,20%	-5,68%	8,56%	0	0
1990	-13,05%	81,43%	8,58%	0	0
1991	5,29%	10,67%	5,26%	0	0
1992	9,16%	23,99%	9,54%	0	0
1993	-0,39%	13,25%	9,73%	0	0
1994	53,79%	-21,09%	3,65%	1	0
1995	-1,63%	-22,38%	9,76%	0	0
1996	7,05%	5,89%	10,03%	0	0
1997	16,38%	9,55%	10,42%	0	0
1998	0,66%	39,67%	7,11%	0	0
1999	1,60%	9,17%	3,99%	1	0
2000	3,48%	3,99%	7,78%	0	0
2001	42,18%	-25,52%	-1,25%	1	0
2002	-1,81%	31,10%	6,06%	0	0
2003	6,45%	13,43%	8,57%	0	0
2004	15,99%	13,71%	4,29%	0	0

SOURCE: SIS, SPO

	k	l	DEP	SECED	INF
YEAR	GROSS FIXED INVESTMENT GROWTH	SKILLED LABOR GROWTH	TOTAL DEPOSITS GROWTH	SECONDARY EDUCATION GROWTH	ANNUAL INFLATION RATE
1980	-1,75%	2,65%	-9,07%	5,35%	89,63%
1981	-4,79%	-0,37%	40,30%	7,46%	44,34%
1982	-0,21%	2,14%	21,72%	7,46%	28,31%
1983	9,23%	3,82%	3,80%	7,46%	25,99%
1984	3,03%	2,98%	8,76%	7,84%	48,55%
1985	8,64%	2,45%	21,35%	5,34%	52,89%
1986	20,94%	5,31%	11,44%	5,82%	35,62%
1987	18,47%	5,26%	16,92%	6,57%	33,47%
1988	7,71%	-0,35%	-5,18%	8,13%	69,73%
1989	-12,45%	1,34%	-5,67%	1,33%	75,48%
1990	10,01%	1,49%	-4,30%	3,93%	57,64%
1991	4,94%	2,96%	12,68%	0,97%	59,17%
1992	5,26%	6,34%	7,27%	6,28%	63,49%
1993	21,52%	-0,74%	-4,21%	3,17%	67,36%
1994	-12,57%	4,91%	23,26%	1,10%	107,27%
1995	5,61%	1,08%	7,76%	-0,56%	87,15%
1996	12,16%	1,76%	33,98%	-1,55%	78,00%
1997	13,49%	3,57%	10,78%	-13,26%	81,22%
1998	-4,02%	3,08%	3,14%	-11,09%	75,32%
1999	-14,59%	4,71%	30,72%	21,41%	55,75%
2000	9,71%	1,91%	-7,47%	6,67%	50,88%
2001	-24,61%	0,61%	20,61%	-11,12%	55,33%
2002	-1,72%	6,22%	-12,40%	30,99%	44,38%
2003	-1,47%	0,70%	-7,68%	-0,66%	22,50%
2004	25,55%	2,51%	11,21%	0,80%	9,46%

SOURCE: SIS, SPO