The Effect of Military Expenditures on the Profit Rates in Turkey

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1. Introduction

There are economic and strategic factors that affect the level of military expenditures in a country. Military spending is a public good that changes with respect to external and internal threats. Therefore, a complex nature of the Military Industrial Complex, bureaucratic inertia, arms race, economic development, and domestic politics determines military expenditures (Töngür et al. 2015).

According to the Stockholm International Peace Research Institute (SIPRI) data, Turkey is the 18th largest military spender in the world. Turkey's military expenditures are mostly from personnel spending as well as from the imports of arms and major security systems. In fact, Turkey was the 6th largest arms importer from 2002-2016, following India, Saudi Arabia, UAE, China, and Algeria, respectively[1] (SIPRI). The low-intensity conflict in the southeastern Turkey (Derin-Güre and Elveren 2014), the Greek militarization (Tekeoglu 2008), aggressive military modernization programs, and the effect of terrorism and (civil) wars in the Middle East are causes of large military expenditures in Turkey. It is also important to note that the Turkish military expenditures and NATO expenditures were in tandem (Chletsos and Kollias 1995; Sezgin and Yildirim 2002). However, NATO spending --excluding Turkey-- has been decreasing up until 2014, while Turkey spending has had an upward trend.

Three phases can be observed in the profit rates in Turkey. While there is a steady decline during the state-led industrialization period from 1954-1980, the profit rates started to recover during the neoliberal era marked with the 1980 military coup, in which export-led regime was

[1] We acknowledge that the arms import data by SIPRI does not correspond directly to military spending, and is measured by time of delivery and not when it is paid. However, this does not change the relative ranking (importance) of Turkey in terms of arms import.

adopted. The recovery period ended, yielding slightly lower but overall steady profit rates in the mid-1990s when the economy experienced three major economic crises and a major earthquake.

Marxist scholars have long discussed the specific linkages between military expenditures and the profit rate. They noted the conflicting role of military expenditures on the economy based on different crisis theories with different underlying assumptions in which military expenditures may affect the profit rate both in terms of capital productivity and the organic composition of capital (Elveren and Hsu 2016). It is relevant to empirically examine this important relationship. In this regard, our goal is to investigate how military expenditures in Turkey affects the profit rates. Turkey is a relevant case study for examining this relationship because it is not just one of the largest military spenders, but also 6th largest arms importer. Moreover, the fact that there are only a few case studies (on the US, the UK, West Germany and Greece) motivates this study to contribute more on the conflicting effect on the military expenditures on the profit rates in the case of a typical arms-importer country.

To this end, we employ an autoregressive distributed lag (ARDL) model and a Markov-switching autoregression (MSAR) model to examine the effect of military expenditures on profit rates in Turkey for the 1950-2008 period for the first time. Our findings show that the effect of military expenditure on profit rates is nonlinear for different time periods and model specifications. There is a negative relationship between military expenditures and profit rates during turbulent years, and a positive relationship in more tranquil years. The negative effects are larger than positive effects, but the probability of positive effects prevailing is larger.

The following section discusses the effect of military expenditures on the profit rates. The third section introduces methodology and data. The fourth section presents and discusses the results. The final section summarizes the findings.

2. The Effect of Military Expenditures on the Profit Rates

Marxist scholars discuss some specific linkages between military spending and the profit rates based on different crisis theories with embedded specific assumptions. Military spending has conflicting effects on the profit rate both in terms of capital productivity and the organic composition of capital (Georgiou 1983; Kollias and Mantias 2003; Coulomb 2004; Dunne et al. 2013; Elveren and Hsu 2016[2]).

Although Engels discussed the role of military expenditures, it can be stated that Rosa Luxemburg was the first Marxist scholars to provide an explicit discussion on the effect of military expenditures on the capitalist economy (Luxemburg 1913). According to Luxemburg, the military and economic conquest of non-capitalist markets is a way to overcome the obstacles in the accumulation process, allowing economies to expand toward external markets.

According to Luxemburg, military expenditures are financed with taxes paid by working class. If these taxes are used to pay state employees and military personnel, the content and quantity of demand for goods produced by the capitalist sector remains the same, leaving the profit rate unchanged. Here, she assumes that the reduction in the consumption of the working class is equal to the increase in the consumption of the same goods by the government officials and the military personnel (Georgiou 1983). If the tax revenue is used to purchase arms, this will boost the average rate of profit as the indirect taxes on working class will reduce wages. Luxemburg's analysis has been criticized as being confused between use-value and value, and between surplus product and surplus value, and mistakenly treating workers who create constant and variable capital and aggregate surplus as separate (Rowthorn 1980; Georgiou 1983; Elveren and Hsu 2016). According to Rowthorn, in Luxemburg's view military expenditures operate

[2] The discussion in this section is based on Elveren and Hsu (2016).

through an ideological effect of militarism rather than they offset underconsumption (Rowthorn 1980).

Some Marxist scholars, on the other hand, interpreted Luxemburg's view as an 'underconsumptionist theory' in which military spending absorbs surplus without increasing productive capacity. Baran and Sweezy (1966) suggested a major theory of under-consumption. They asserted that the military sector leads to higher rates of profit and lower levels of competition by taking in the economic surplus created by capitalism in the monopolistic stage. Baran and Sweezy argued that excessive military expenditures in the 1940s and 1950s encouraged aggregate demand. Military expenditures helped to keep unemployment at lower levels. Moreover, research and development in the military sector benefitted civilian sectors, stimulating the competitiveness and profit margins of those firms. On the other hand, the production in the military sector becomes more capital intensive through time, requiring fewer employees with more skills. Therefore, military expenditures' capacity to prevent the fall in the profit rate declines. Finally, they noted that financing military expenditures with large amounts of taxation can harm economic activity.

Baran and Sweezy's view was criticized on a few grounds (Georgiou 1983). First, the working class was assigned a passive role in Baran and Sweezy's analysis, although the state of class struggle is a key determinant in the size of economic surplus. Second, Baran and Sweezy use a much broader concept of economic surplus than the Marxian one, and their conceptualization is not relevant to the capitalist mode of production. Third, although the method of financing military expenditures has different effects, they do not specify the method.

The revisits of Baran and Sweezy's analysis (Reich and Finkelhor 1970; Kidron 1970; Magdoff 1970; Reich 1972; Kalecki 1972; Hunt 1972; O'Connor 1973; Cypher 1974; Weisskopf

1976; Mandel 1978) have also failed to address the question of whom ultimately pays for the military expenditures (Gottheil 1986). Among these revisits, Kidron's 'the permanent arms economy' has become a major theory which explains how militarism stabilizes the capitalist system (Kidron 1970). First, as noted by Luxemburg, pursuing imperialist policies by means of higher military expenditures allows the economy to expand further, preventing a fall in the profit rate. Second, military expenditures prevent the realization of a surplus resulting from under-consumption by stimulating aggregate demand. Finally, military research and development encourage the development of new products and technologies in the non-defense sectors which is called technological spin-off effect. Mandel (1978) noted some other characteristics of military expenditures that help prevent a decline in the profit rate. The prices and profit margins in the defense sector are set up through a direct negotiation between the state and the arms industry. This makes it possible for firms in the defense sector to obtain a much higher rate of profit than a corresponding firm in competitive markets. He also noted as military expenditures are neither dependent on peoples' purchasing power nor on economic fluctuations, the defense sector is likely to enjoy a steadily higher profit rate (Mandel 1978).

The permanent arms economy theory has been criticized by not having a historical perspective (Purdy 1973, cited in Georgiou 1983). On the empirical side, Kaldor (1977) finds that there is an inverse relationship between military spending as a percentage of GNP and capital investment as a share of GNP, and that countries with lower military R&D expenditure have higher civil R&D expenditure. Moreover, Szymanski (1973) and Smith (1977) find that there is a negative effect of higher military expenditures on the economy, opposing to what the permanent arms economy theory suggests.

There exist a few studies that investigate the role of military expenditures on the profitability; three time-series studies, Georgiou (1992), Kollias and Maniatis (2003), Dunne et al. (2013); and two-panel studies, Elveren and Hsu (2016), and Elveren and Dunning (2017).

Georgiou (1992) uses an OLS methodology to examine the effect of military expenditures on profit rates in the UK, US and the former West Germany for the period from 1958-1987 with respect to Luxemburg's and Mandel's views. The study finds positive significant effect of military expenditures on profit rates in the case of the US, and insignificant effects for the other two countries. Kollias and Maniatis (2003) employ the autoregressive distributed lag model (ARDL) to find that while military expenditures have a positive effect on the profit rate in the short run, they have an inverse relationship in the long run in the case of Greece during the 1962-1994 period. Dunne et al. (2013) examine the case of the US for the period from 1959-2010. Based on OLS and ARDL methods, the study provides some evidence on the positive long-run relationship between the military burden and the profit rate.

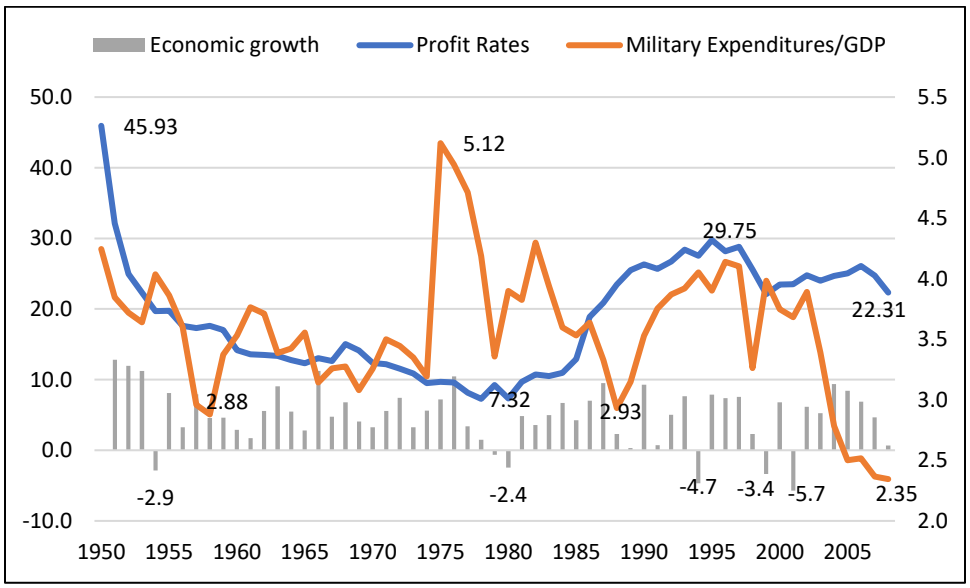
Elveren and Hsu (2016) in a Marxist framework as in the previous studies, employ a panel ARDL lag model to analyze 24 OECD countries for the period from 1963-2008. Their findings suggest that while there is positive linkage between military expenditures and profit rates for the whole period, in the post-1980 era, the impact of military expenditures was negative. The authors also find weak evidence suggesting that while for arms-exporting countries there is positive linkage between military expenditures and profit rates, the linkage is negative for non-arms-exporter countries.

Finally, adopting a dynamic ordinary least square model, Elveren and Dunning (2017) examine the same issue for an extended set of 32 countries for the 1963-2008 period. Their findings support and strengthen those of Elveren and Hsu (2016).

Although there is a sizable literature on the effect of military expenditures on economic growth in Turkey[3] (Töngür and Elveren 2016), no study deals with the effect of military expenditures on the profit rates, a major indicator of a capitalist economy.

Figure 1 shows the patterns of profit rates and military expenditures to GDP ratio, as well as economic growth in Turkey from 1950 to 2008.

Figure 1: Profit Rates and Military Expenditures/GDP



Source: Authors' compilation based on data from TurkStat, Ongan (2011), COW, and SIPRI

The most remarkable change is a substantial jump between 1974 and 1975, from 3.19 per cent to 5.12 per cent, due to the battle for Cyprus in 1974. Then, as the second notable pattern, military expenditures fell down to 2.93 per cent in 1988, followed by an increase as high as 4.14 per cent in 1996 with a negligible decline in 1995 due to the economic crisis of 1994. This is due

[3] The majority of causality analyses suggest the existence of a positive relationship and unidirectional causality, mostly running from military expenditure to economic growth. The results of the studies that are based on a structural model, on the other hand, are inconclusive, providing a positive effect (Sezgin 1997, 2001, and Halıcıoğlu 2004), a negative effect (Özdemir and Bayar 2006), and an insignificant effect (Özsoy 2000, Töngür and Elveren 2016). Addressing this inconcluive results of linear analyses, Yolcu Karadam et al. (2017) showed that for the Middle Eastern countries including Turkey during the 1988-2012 period, the effect of military expenditure on economic growth is nonlinear, such that as the levels of military spending increase, its positive effect on economic growth decreases and becomes negative after some time.

to aggressive military modernization programs that aim to devote an average of 1 billion $ per year during the 1985-1995 period, which also overlapped the low-intensity conflict in the southeastern Turkey (Kazgan 2001; Günlük-Şenesen 2002).

The third pattern has been observed during the ruling Justice and Development Party (AKP with its Turkish acronym), declining from 3.89 per cent in 2002 to 2.35 per cent in 2008, the end of the study period, and to 1.99 per cent in 2016. It is important to note that the downward trend in resources allocated defense in the 2000s does not necessarily imply the reduction in arms purchases as the currency has appreciated[4] (Günlük-Şenesen 2010).

There are three distinct phases in the profit rates. The first phase, a contraction period, from 1950 to 1980, is a steady decline in the rate of profits. This is a period in which a state-led industrialization has been implemented. The government established State Economic Enterprises (SEEs) for industries needing large amounts of capital. Turkey adopted a strategy of industrialization through import substitution policies, joined with intensive government intervention under the Development Plans from the early 1960s to 1980. This phase ended with the military coup in 1980. The second phase, the recovery, in which the profit rates increased substantially continued throughout the 1980s and the first half of the 1990s. The coup facilitated the establishment of neo-liberal paradigm by repressing the voice of civil society and shutting down the country's largest labor union. The civilian successor of the military government that was elected in 1983 followed the same neoliberal model, having a complete commitment to the IMF and World Bank's agenda. As a result, the main characteristic of the post-1980 period in Turkey was a substantial decline in real wages.

[4] See also Günlük-Şenesen and Kırık (2016) for a detailed analysis of the budget expenditures of the military during the 1998-2014 period.

The third phase is characterized by a slight decline in the profit rates from the mid-1990s to the end of the study period. There have been three major economic crises in this period (i.e. 1994, 2000-2001, and 2008). Moreover, the earthquake in 1999 hit the Turkish economy. However, despite all these negative developments, there has only been a slight decline in the profit rates.

What was the role of military expenditures on the profitability of the Turkish economy? To answer this question, we employ a Markov-switching autoregression (MSAR) model[5].

3. Method and Data

3.1 Method

We use an autoregressive distributed lag (ARDL) model as well. However, we skip the formal introduction of the model to save space. The absence of a linear relationship led us to employ a nonlinear model for our research. Markov-switching models were initially developed by Quandt (1972), and Goldfeld and Quandt (1973), and Hamilton (1989) introduced autoregression to this type of analyses. Following these works, we used a Markov-switching autoregression (MSAR) model in this study. In MSAR models, the variables can exhibit different patterns under different regimes (states). These regimes cannot be observable but they can be predicted. The random switches between the states are known as Markov processes. The coefficients of variables, autocorrelation terms, and variance may change under these regimes. The following MSAR model can capture all these properties:

[5] The first work that employs a Markov switching model for Turkish military expenditure is Smith, Sola and Spagnolo (2000). The study examines the strategies played by Greece and Turkey during the period of 1958-1997. The study found that for each country plays independently with very high probabilities of staying in states of high or low expenditures, suggesting that the level of military expenditures is mainly determined by bureaucratic and political inertia,

$$y_t = \mu_t + x_t\alpha + z_t\beta_{s_t} + \sum_{i=1}^{P} \varphi_{i,s_t}(y_{t-i} - \mu_{s_{t-i}} - x_{t-i}\alpha + z_{t-i}\beta_{s_{t-i}}) + \varepsilon_{t,s} \quad (1)$$

In this model,

y_t: dependent variable

μ_t: state invariant constant term

x_t: vector of exogenous variables with state invariant coefficients α

z_t: vector of exogenous variables with state-dependent coefficients β_{s_t}

φ_{i,s_t}: ith AR term in state s_t

$\varepsilon_{t,s}$ ~ iid $N(0, \sigma_s^2)$

σ_s^2: state-dependent variance

The number of states can be exogenously determined in Markov-switching models, and two states are used in our study. As a result, the probability transition matrix can be defined as follows:

$$P = \begin{bmatrix} p_{11} & p_{12} \\ p_{21} & p_{22} \end{bmatrix} \quad (2)$$

where,

$$\sum_{i,j=1}^{2} p_{ij} = 1 \quad (3)$$

In this matrix, p_{11} reflects the probability of state 1 to continue in the next period given that the process is already in state 1. Similarly, p_{22} reflects the probability of state 2 to continue. On the other hand, p_{12} and p_{21} reflect the probability of switching from one state to another. By definition, the sum of $p_{11} + p_{12}$ or $p_{21} + p_{22}$ is equal to one as stated in equation (3).

3.2 Data

Our dependent variable is profit rate, *profit*. *Profit= Π/K* where *Π* is income on capital and *K* is a measure of capital stock, all at current prices. It can be decomposed into *profit= (Π/Y)(Y/K)* where *Y* is nominal GDP, *Π/Y* is the share of profits in GDP, and *Y/K* is the output-capital ratio. The data of profit rate is taken from Ongan (2011). Ongan (2011) computes profit rates for the manufacturing sector in Turkey based on national accounts by generating the capital stock data by using "perpetual inventory model."

Our main explanatory variable is the military burden, military expenditures as a share of GDP. We use the data provided by the Correlates of War Project (COW) for the 1950-1959 period. For the rest of the period, we use the data provided by the Stockholm International Peace Research Institute[6] (SIPRI). There are several positive and negative channels where military spending affects economic growth and profit rates depending on different assumptions on full employment and the structure of military expenditures in terms of R&D or personnel expenditures (Kollias and Mantias 2003; Elveren and Hsu 2016). Higher spending stimulates aggregate demand, prevents the rise in organic composition of capital and accompanying fall in the profit rate, and increases the rate of surplus value by increasing labor productivity. Regarding the negative effects, on the other hand, increasing military spending may lead to crowding out of

[6] We acknowledge that definitions used by COW and SIPRI are different. However, we still prefer to use these two sets together in line with a major work of Nordhaus et al (2012). Moreover, we note that our results remain the same even if the analysis period begins with 1960 by using only SIPRI data.

investment, and decrease in productivity through the purchase of "unreproductive" goods, and reduce the profit rates by increasing the organic composition of capital through expanding a capital-intensive sector, and taxing capital income.

Unemployment statistics for the period from 1950-1979 are provided by Tuncer Bulutay (1995), and the rest of the period is obtained from the TurkStat. On the one hand, it is expected that an increase in unemployment reduces wage bargaining power, therefore increases the rate of surplus value and the rate of profit. On the other hand, rising unemployment reduces effective demand and raises the organic composition of capital, thereby reducing the rate of profit at the same time. Economic growth data is obtained from TurkStat. One expects a positive relationship between economic growth and profit rates as economic growth leads to higher capital accumulation. Finally, we use the variable of *Pigou* (e.g. Pigouvian exploitation of labor) as defined as the marginal product of labor divided by real wages. Therefore, one expects a positive relationship with Pigou and profit rates. The data is obtained from Elgin and Kuzubas (2012).

4. Results and Discussion

We first use an autoregressive distributed lag (ARDL) model based on Pesaran and Shin (1998) and Pesaran, Shin and Smith (2001) with two alternative model specifications.

Table 1: ARDL Co-integration Results

	ARDL (2, 0, 0, 2)	ARDL (1, 1, 0, 0, 1)
Short Run Coefficients		
Profit (-1)	1.127*** (0.147)	0.932*** (0.066)
Profit (-2)	-0.227 (0.150)	
Milex	0.071 (0.136)	0.236 (0.183)
Milex (-1)		-0.322* (0.181)
Growth	0.416 (0.455)	1.449*** (0.429)
Unemp	0.026 (0.227)	-0.247** (0.117)
Unemp (-1)	-0.559* (0.315)	
Unemp (-2)	0.424* (0.226)	
Pigou		0.808*** (0.188)
Pigou (-1)		-0.830*** (0.208)
Trend	-0.014 (0.018)	-0.056*** (0.017)
Intercept	-9.263 (10.269)	-32.586*** (9.698)
Long Run Coefficients		
Milex	0.719 (1.291)	-1.279 (3.576)
Growth	4.192 (4.970)	21.500 (21.480)
Unemp	-1.089 (1.147)	-3.673 (3.207)
Pigou		-0.321 (2.441)
Trend	-0.141 (0.208)	-0.843 (0.865)
R-squared	0.936	0.952
Serial correlation	0.849 [0.435]	1.202 [0.279]
Functional form	0.002 [0.964]	2.853 [0.099]
Heteroscedasticity	0.850 [0.565]	0.747 [0.649]
Bounds Test F-Statistics	0.593 I(0) I(1) 10% 3.17 4.00	2.076 I(0) I(1) 10% 2.90 3.82

Note: *, ** and *** refer to significance at the 10%, 5% and 1% levels, respectively. Standard errors and probabilities are in parentheses and brackets, respectively.

The errors of the models are serially independent, and the error correction models hold. We cannot reject the hypothesis of "No Long-Run Relationship" even at 10% significant level with respect to the Bounds tests in both models. The absence of the linear relationship encouraged us to employ a Markov switching model to investigate the possible nonlinear relationship between military expenditures and profit rates.

The MSAR model of equation (1) is estimated for 1952-2008 with annual data[7]. In this model, profit rate, *d(profit)*, is used as a dependent variable; unemployment rate, *d(unemp)*, and Pigou exploitation variable, *d(pigou)*, and a constant term are used as state invariant exogenous variables; military expenditure to GDP ratio, *d(milex)*, is used as a state-dependent exogenous variable. As the letter *d* suggests, all variables are used in difference form according to unit roots tests results. The estimation also includes state-dependent first order autoregressive term, AR(1), and state-dependent variance. Schwarz's Bayesian Information Criterion (SBIC) is used to decide whether a variable is state-invariant or state-dependent, and the model with lowest SBIC is chosen.[8] The estimation results of the MSAR model is given in Table 2 below.

[7] It is important to note that the analysis for the 1960-2008 period based on SIPRI data produces the same results which can be provided upon request.
[8] The authors can provide the results of these alternative models upon request.

Tablo 2. MSAR Model

d(profit)	coefficient	standard error	z	P>|z|	95 % Conf. Interval	
d(growth)	16.224	0.311	52.13	0.000	15.614	16.834
d(unemp)	-0.204	0.012	-15.82	0.000	-0.229	-.0179
d(pigou)	6.163	0.0966	63.79	0.000	5.974	6.352
constant	-0.799	0.014	-57.00	0.000	-0.827	-0.772
State 1						
d(milex)	-3.295	0.037	-86.99	0.000	-3.369	-3.221
AR(1)	-0.411	0.011	-35.58	0.000	-0.433	-0.388
State 2						
d(milex)	0.215	0.102	2.11	0.035	0.015	0.416
AR(1)	0.507	0.062	8.15	0.000	0.385	0.629
σ_1	0.03	0.007			0.018	0.049
σ_2	1.21	0.124			0.989	1.482

The results show that all variables are statistically significant. As expected, the change in GDP growth rate has a positive relationship with the change in profit rate, as economic growth leads to more capital accumulation. The unemployment with negative coefficient, on the other hand, is against our expectations. Higher unemployment rate is expected to lead lower wages, and thus a higher profit rate. However, there may be a countertendency mitigating the positive effects of unemployment on the profit rate. Higher unemployment, and thus lower economic

activity, can lead to realization problems and create negative pressure on the profit rates. That is to say, our finding is in line with the effective demand argument rather than "reserve army of labor." In fact, the variable of Pigou exploitation strengthens this argument. This effect is defined as the marginal product of labor divided by real wages; a positive change in this effect can mean either a rise in productivity or a fall in real wages (or both). Thus, a decline in real wage, which is likely to reduce the effective demand, can be captured better by this variable. The coefficient of Pigou exploitation suggests the existence of a positive relationship with the profit rate. Military expenditure is our only state-dependent variable other than AR(1) term, and there is a negative (positive) relationship between military expenditures and profit rates under state 1 (state 2). The probabilities of these states can shed more light on the nature of these switching coefficients. As Figure 2 below shows, the probability of state 1 is high during economic and/or political crises years. The probability of state 1 is high in the early 1960s, oil crisis of 1973, late 1970s and early 1980s, late 1990s and early 2000s[9]. And the probability of state 2 is high during relatively more tranquil times as Figure 3 shows below. Military expenditures and profit rates have a negative relationship under state 1 and a positive relationship under state 2. Similarly, AR(1) term is statistically significant and has a similar sign reflecting the persistence of these regimes. Finally, volatility of the model seems to increase in tranquil times as σ_2 is greater than σ_1.

[9]The early 1960s reflect the aftermath of a military coup d'etat and two unsuccessful coup attempts, and the late 1970s reflects Turkey's foreign debt crises and economic turbulence as ability to pay foreign debt or rollover these debts disappeared (Boratav 2016). The military government between 1980 and 1983 as well as economic contraction followed these economic problems. The late 1990s reflect international economic turbulence similar to the 1970s as East Asian and Latin American crises increased the risk premia for developing countries and these developments adversely affected the Turkish economy. And the economy was hit hard once again in fall 2000 and winter 2001. Based on these stylized facts, the probability of state 1 seems to rise in turbulent years, and the probability of state 2 increases in more tranquil times.

Figure 2: The Probability of State 1

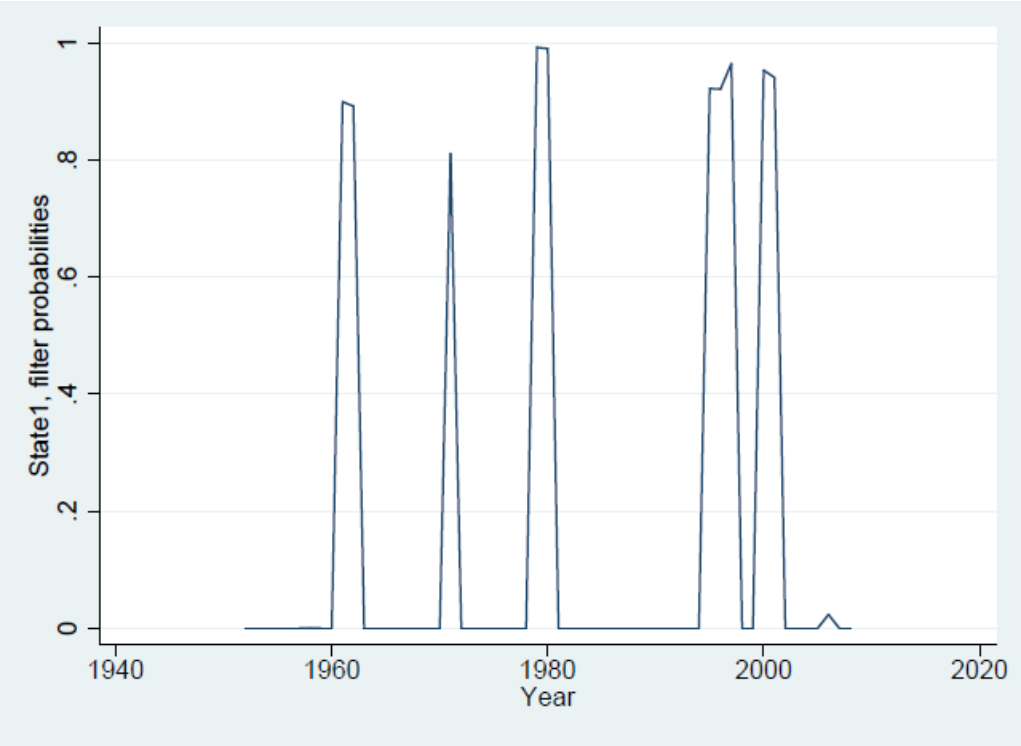
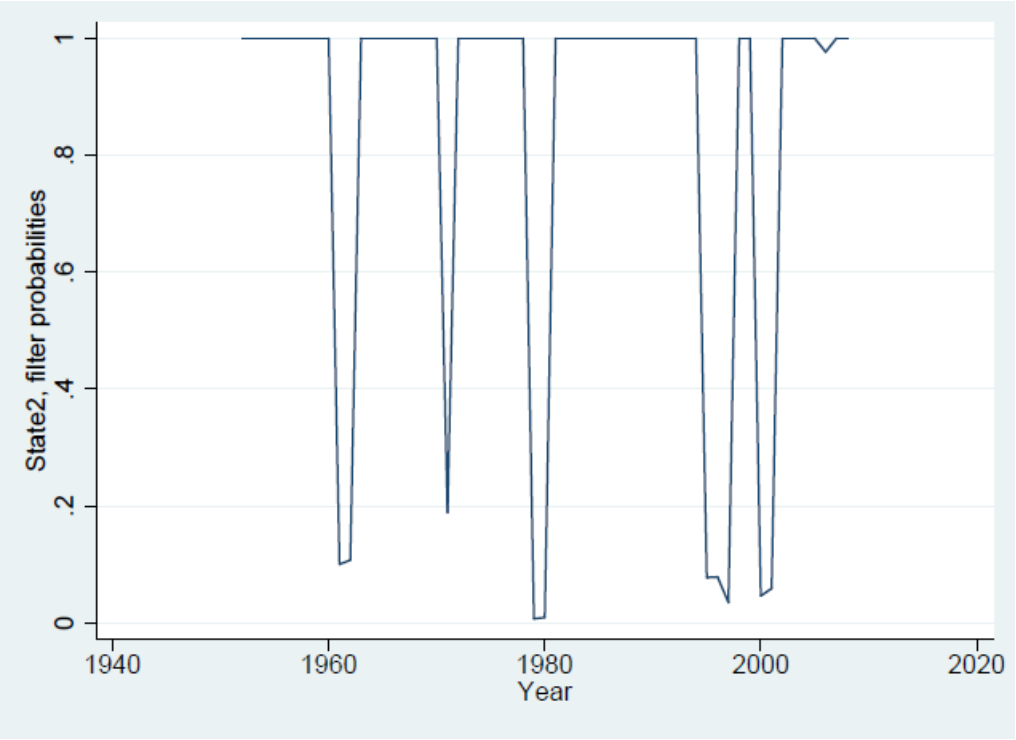


Figure 3: The Probability of State 2



The transition probabilities and expected duration of states are given in Table 3 below. Expected duration of state 1 is 1.98 years and state 2 is 10.47 years on average. The probability of a process that started in state 1 to stay in state one is 0.495, and to switch to state 2 is 0.504. These probabilities show why the expected duration of state 1 is shorter than that of state 2. Similarly, the probability of a state 2 process to remain there is 0.904 and switch to state 1 is 0.05. The findings in Tables 3 suggest that military expenditure has a positive relationship with profit rates in most years, and a negative relationship takes place in some years[10].

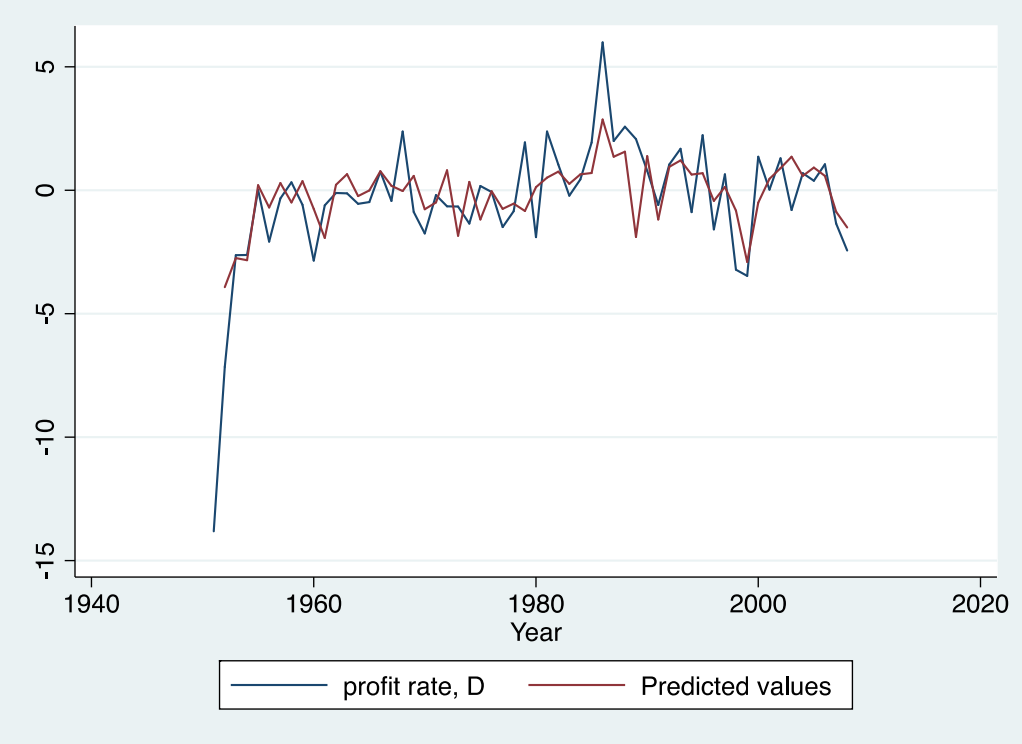
Table 3. Transition Probabilities and Expected Duration

	Trans. Probabilities		Expected Duration
State 1	P_{11}	0.495	1.98
	P_{12}	0.504	
State 2	P_{21}	0.095	10.47
	P_{22}	0.904	

In order to compare the actual data and predicted values by our model, we also used one-step predictions for the dependent variable and compared it with the actual profit rate data. Figure 4 below shows that our predicted values closely follow the actual data for the first difference of profit rate.

[10] This finding supports Elveren (2012) and Aksoğan and Elveren (2012) in that higher military expenditures are also associated with higher pay/income inequality for the period from 1963-2007 as there is a positive relationship between the profit rates and income inequality.

Figure 4. Predicted and Actual Values of d(profit)



5. Conclusion

Turkey is one of the largest military spenders. The average ratio of military expenditures to GDP during the period from 1950-2008 is as high as 3.58 per cent. The reasons for such a high military burden are the low-intensity conflict in the southeastern Turkey, the Greek militarization, aggressive military modernization programs, the effect of terrorism and wars in the Middle East, and being a NATO member. Considering the fact that Turkey's military expenditures are mostly from the imports of arms and major security systems, making it the 6th largest arms importer in the world, it is important to examine the effect of such high military spending on the economy. In fact, there is a sizable literature on the effect of military

expenditures on economic growth in Turkey. However, there is lack of empirical investigation on the existence of the relationship between military expenditures and the profit rates.

The goal of this study was to examine the possible relationship between military expenditures and the profit rate in Turkey. The findings suggest the existence of a nonlinear relationship between the variables in question during the 1950-2008 period. Accordingly, while the during economic downturns military spending reduces the profit rates further, it boosts the profitability during the regular periods.

The findings provide evidence for the Marxist argument that military expenditures help to overcome the fall in profit rates. This is more likely to occur via a decline in wages based on Luxemburg's view. Accordingly, when tax revenue is used to purchase arms, this will increase the average rate of profit as the indirect taxes on working class reduce wages.

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