Ph.D. Dissertation of Public Policy

Three Essays on the Military in Politics and Public Policy

군의 정치참여와 공공정책에 관한 연구

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Abstract

The dissertation provides insight into very basic and fundamental questions in the determinants of public policy. The three papers answer fundamental questions of the theory of public policy. Does the military involvement in politics affect public policy? How does it affect public policy? Is the public policy run differently depending on the level of the military in politics? If so, how is it different? What is the role of democracy and corruption in policy decision process?

I argue that the range of political institutions considered in the existing literature can be expanded to explain the policy gaps by using the theory of civil-military relations as most studies use a level of democracy or democracy dummy for political institution measures. The military in politics measures the level of involvement of the military in politics and it would be a good analytic concept and framework to explain how different policies are adopted by different countries.

For the empirical analysis, I first construct a panel dataset of 129 countries using various data sources including International Country Risk Guide (ICRG), Polity I, Stockholm International Peace Research Institute (SIPRI), and International Institute for Strategic Studies (IISS), and World Bank. I also utilize various estimation methods such as ordinary least square (OSL), random-effect (RE), fixed-effect (FE), and system generalized method of moments (SGMM) for the empirical evidence, sensitivity analysis, and robustness check.

In the first paper, I build the theory of military in politics and defense policy to understand how the military involvement in politics would affect the defense policy and test for empirical evidence. The defense expenditure and military service system are used as a proxy measure for the defense policy. The empirical result shows that

the military involvement in politics increases the defense expenditure measured as a percentage of GDP and percentage of government expenditure and the countries with a high level of military involvement in politic tend to keep the conscription system for the military service system.

The second paper seeks to examine the impact of the military involvement in politics on the education and health expenditure. It also examines the role played by the democracy in reducing the social policy gap. I find that the military in politics has a significantly negative relationship with the education expenditure, but it does not have a statistically significant relationship with health expenditure. Furthermore, the result indicates that the democracy plays an important role in reducing the negative impact of the military in politics on the education expenditure and health expenditure.

Finally, in the third essay, I investigate the relationship between corruption and defense expenditure considering the impact of the military in politics. The result shows that the corruption has a negative moderating effect that in the countries with the same level of military in politics, the defense expenditure is lower in more corrupted countries. The result is consistent in all estimation methods, sensitivity analysis, and the robustness check.

Keyword : Military in Politics, Public Policy, Government Expenditure, Corruption, and Democracy
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Chapter 1. Introduction to the Dissertation

The three essays provide insight into very basic and fundamental questions in the determinants of public policy. The first paper seeks to find the determinant of defense policy. The second paper examines the social policy gap among nations. The third paper documents the relationship between the corruption and defense expenditure considering the military in politics.

The literature on policy determinants theory seeks to find the determinants of public policy. It was first developed by scholars in finance to examine the government expenditure using socio-economic factors, and various policies have been examined using various economic, political, and institutional variables as determinants as the theory develops. The theory of democracy and public policy explains how democracy affects public policy and finds policy gap between democratic and autocratic countries (Boix, 2003; C. B. Mulligan, Gil, & Sala-i-Martin, 2004).

This paper challenges the existing theory of democracy and public policy and expands the policy determinants theory by examining the policy gaps using the theory of civil-military relations. I argue that the military in politics would be a good analytic framework and principle to explain how different policies are adopted by different countries.

In the first paper, I build the theory of military in politics and defense policy to understand how the military involvement in politics would affect the defense policy and test for empirical evidence. The defense expenditure and military service system are used as a proxy measure for defense policy. Based on the analysis model constructed by Albalate, Bel, and Elias (2012), I conduct the pooled-OLS estimation,

random-effect estimation, and fixed-effect estimation for the cross-validation. Furthermore, I also conduct the two-step system generalized method of moments (SGMM) for the robustness check. The results show that the countries with a high level of military in politic tend to spend more national resources on the defense expenditure measured both as a percentage of GDP and percentage of government expenditure and the countries with a high level of military in politic tend to keep the conscription system for the military service system after controlling for the previous war experience, population, population age between 15-29, GDP per capita, government expenditure as a share of GDP, size of military personnel, and democracy. I find these results are consistent with all three models and the robustness check.

The second paper seeks to examine the impact of the military involvement in politics on the education and health expenditure. It also examines the role played by the democracy in reducing the social policy gap. The theory of the military in politics suggests that the military in politics greatly increases the defense expenditure, but the gun or butter theory advises that if the defense expenditure is increased without increasing total product, national resources devoted to civilian sectors are suffered. In other words, increases in defense expenditure may distort resource allocation, especially the redistribution policy. I find that controlling for the GDP per capita, population, population age over 65, and government expenditure as a share of GDP, the military in politics has a significantly negative relationship with the education expenditure, but it does not have a statistically significant relationship with health expenditure. Furthermore, I find that the democracy plays an important role in reducing the negative impact of the military in politics on the education expenditure and health expenditure through the interaction effect model.

In the third essay, I investigate the relationship between corruption and defense expenditure considering the impact of military in politics. The corruption scandals in the defense sector have repeatedly reported across the world. And, it is argued that the defense sector is vulnerable to corruption (Gupta, De Mello, & Sharan, 2001; Setzekorn, 2014; Tanzi, 1998). I empirically test the relationship between the military in politics and corruption based on the model by Gupta et al. (2001) and find that corruption has negative moderating effect in the military in politics and defense expenditure relationship after controlling for previous war experience, population, GDP per capita, government expenditure as a share of GDP, size of military personnel, democracy, age-dependency ratio, and arms import.

The three papers answer fundamental questions of the theory of public policy. Does the military involvement in politics affect public policy? How does it affect public policy? Is the public policy run differently depending on the level of the military in politics? If so, how is it different? What is the role of democracy and corruption in policy decision process?

The military is a politically noteworthy group that can influence the decision-making process because the military not only played its part in defending and protecting the state and the people but also, they sometimes overthrew the state. Therefore, it is crucial to consider the political involvement of military when talking about the state and its system and the policy because its impact on the policy process is far greater than what we expect.

Chapter 2. The Military in Politics and Defense Policy: Theory and Evidence

2.1. Introduction

Does a military involvement occur in the national politics and policy process? If so, how? What is the impact of the military in politics on defense policy? These are the central questions of this chapter. In this paper, the defense expenditure and military service system are used as proxy measures for defense policy as the defense expenditure and military service system have been major and controversial issues in defense policy for many decades. The military's demand for manpower as well as acquisition of the state-of-art weapons and equipment for strengthening the wartime capability is always high.

There have been continuous efforts to understand the determinants of defense expenditure as it is a key issue in post-conflict situations (Albalate et al., 2012; Batchelor, Dunne, & Lamb, 2002; Collier & Hoeffler, 2006, 2007; J. P. Dunne, Perlo-Freeman, & Smith, 2008; Yildirim & Sezgin, 2005). All studies concluded that the democratic countries spend less national resources on the defense than autocratic countries.

I argue that the theory of civil-military relations is better suited as the determinant of defense expenditure and to explain the defense expenditure gaps among nations. The concept of the military in politics would be a good analytic tool because the most countries have some form of military, but its involvement in politics varies. Also, the policy outcome can be varied depending on the military

involvement level because the military is organized and given the power to protect a polity from external threats while it has the potential to threaten the polity itself.

Therefore, this chapter examines the relationship between the military in politics and defense expenditure and military service system. And, to be clear, the military in politics is defined as any form of military involvement in politics (Howell, 2011), and it assumes that civilian controls of the military occur within a context of some form of military involvement in politics. This chapter organizes as follows: the next section provides a comprehensive discussion of a theoretical model of military involvement in politics and its links with defense policy. Section III provides a review of the relevant literature. Section IV describes the panel data set and methodology. Section V provides the empirical strategy for the military in politics and defense policy. Section VI presents the empirical findings. Section VII concludes.

2.2. Theoretical Background

This section has been subdivided into three sections. In section A, I provide a comprehensive review of the literature related to the theory of civil-military relations. In section B and C, I discuss causes and consequences of the military involvement in politics. Finally, in section D, I present the theoretical relationship between military in politics and defense policy.

A. Theory of Civil-military Relations

The theory of civil-military relations is very broad fields of study. According to Huntington (1957), the civil-military relations is actually the relationship between

the state is the active directing element of society and the officer corps is the active directing element of the military. There are two distinct tracks in the literature of civil-military relation. The first track is a sociological approach to examine the military, and it explores the relationship between the society and military. The second track is an institutional approach to examine the postcolonial civil-military relations; it mainly focuses on the problem of coups.

In this study, the political and institutional aspect of civil-military relations is reviewed for the theoretical framework. The mainstream works of civil-military relations focus on: 1) how to maintain the civilian control of the military and how much control is enough (Agüero, 1995; Huntington, 1957) and 2) problem of the coup and civil-military Friction (Ben-Meir, 1995; Herspring, 1996; Stepan, 1988). It is based on the idea that there should be civilian control of the military and a strict separation between the civilian and military is desirable because the military is created to protect the nation and, at the same time, given sufficient power to overthrow its government. However, in post-conflict situations, studying the military influences on policy through various political involvement instead would be much more meaningful because the coup/no-coup dichotomy misses much of the aspects of civil-military relations as Feaver (1999) mentioned, *"Military influence captures the idea that the military institution may be politically powerful even when it does not seize direct power through a forceful takeover"* (p. 218).

The theory of control of military established by Welch (1976) argues that there is a continuum of relationships exists between the influence of the military institutions and the influence of civilian institutions relative to implementation of policy." The relationship between the military institution and civilian institutions as depicted in Figure 2-1.

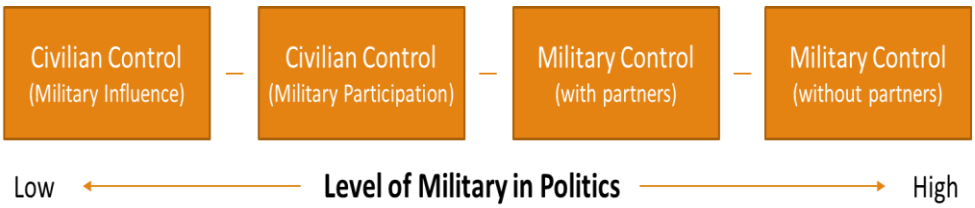

Figure 2-1 A continuum of the relationship between Military and Civilian Institution

Military influence under civilian control is a situation when the military involvement in politics is lowest, the military is not ruled out of political participation, but the political role of civilian and military forces is clear and the influence of military is exercised only through the normal channels. Various political activities such as lobbying for the budget and providing information for strategic decision-making are carried out within the institutional framework. Military participation under civilian control is a situation, in which independent activities of the military in certain political or policy areas are legally guaranteed. In some cases, the political and policy decisions of the state are made through consultation between the civilian institutions and the military.

Under the military control, the civilian control over the military disappears, and the civilian government can no longer supervise the role and function of the military. The military decides on most issues. Finally, the difference between the two types of military control is whether the military makes a policy decision at the front, or whether it supports political forces behind the policy environment.

Rahbek-Clemmensen et al. (2012) have conceptualized four dimensions of a civil-military gap as depicted in Table 2-1, and they are a cultural gap, demographics gap, policy preference gap, and institutional gap. Above all, I focus on the policy preference gap because it can directly explain the differences in policy between

countries. The policy preference gap refers to differences in the policy objectives pursued by military and civilian elites. If the military and civilian elites have and pursue different policy objectives, then depending on the balance of the power between them, in other words, depending on the level of military involvement in politics, the policy outcome would be different. Thus, the military involvement in politics can be a determinant policy that can explain the policy gap between countries.

Table 2-1 The Four Dimensions of the Civil-Military Gap

Gap Type	Cultural Gap	Demographics Gap	Policy Preference Gap	Institutional Gap
Description	Value differences between military and civilian population	Differences in the composition of the military and civilian populations	Differences in the policy objectives pursued by military and civilian elites	Differences between military and civilian institutions
Key variables	Mutual perception, norm socialization processes, organizational path dependencies	Geographical origins, ethnicity, political affiliation, socioeconomic or family background	Expressed policy preferences, rational gain divergences, historical and entrenched preferences	Functional differences, institutional identities, myths, and prejudice

Note. Reprinted from "Conceptualizing the civil-military gap: A research note," by Rahbek-Clemmensen, J., Archer, E. M., Barr, J., Belkin, A., Guerrero, M., Hall, C., & Swain, K. E., 2012, *Armed Forces & Society, 38(4)*, 669-678.

B. The causes and consequence of the military in politics

Why does the military involvement in politics occur? According to Ball (1981), the military has four main reasons for seeking a political role as an institution. First, the military wants to maintain of or increase in the military's share of national resources. This tendency is not limited to the military and it appears in all groups within the political system. However, after the conflict periods, the World War II and

Cold War, the world defense expenditure as a percentage of gross domestic products (GDP) is showing downward slope. In the 1960s, the world defense expenditure is estimated at $688 billion, equivalent to approximately 3.3 percent of GDP. The world defense expenditure is estimated at $1,686 billion in 2016, equivalent to approximately 2.1 percent of GDP. As depicted in figure 1, the total amount of defense expenditure has increased over time while the world defense expenditure as a percentage of GDP has gradually decreased.

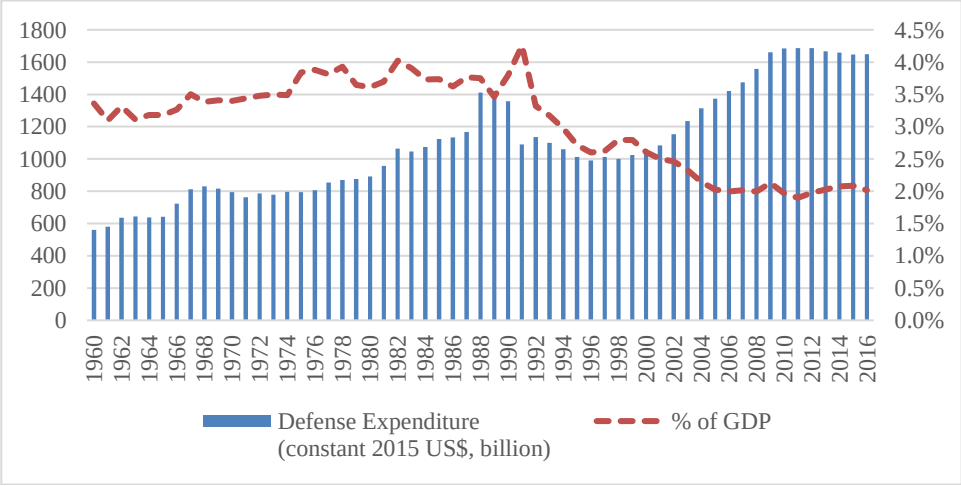

Figure 2-2 World Defense Expenditure, 1960-2016
Data: SIPRI Military Expenditure Database 2017

Reducing the allocations of national resources to the military might be due to a financial burden on the nation, but it can also be a means to control the military and its influence. It is accepted as a challenge to the military's integrity and this challenge leads the military to participate in politics. Recent trends in the defense expenditure give the military incentive to engage in policy process actively to secure a sufficient share of national resources for maintaining the military. Notably, unlike other groups, the military is able to carry out their demands more straightforwardly because they are in charge of the security that is associated with the survival of the nation.

Second, the military wants to maintain its integrity. The military, which has a very rigid hierarchy, is very hostile to the military being excluded from the decisions and management for internal matters such as military size and promotion. For example, in the case of Ghana (1966) and Brazil (1968), a coup d'état arises as a result of resistance to military reforms by the national leader, suggesting a country overthrow (N. Ball, 1981). Therefore, the military seeks to expand their role in politics as part of its continued influence within the country.

Third, in case of the government being incompetent, corrupt, and disorder, the military intervenes in the politics because they fear of the national disintegration. Such an intervention is realized in the form of a coup d'état. And fourth, the expansion of the concept of 'national security' to include internal securities. Within the expanded concept of the national security, the military naturally participates in politics. The military develops doctrines and skills with the expertise to defend the nation from enemy's threats. This advancement makes the military interested in both domestic and international situations and to bring various strategies and guidelines to deal with it. This inevitably expands the military's political involvement.

Then, what are the consequences of the military in politics? Frist, the risk of war increase as the national defense policy can be more aggressive. The military makes choices about the use of force as officers are accustomed to employing military solutions (Brecher, 1996). Militarism and its aspect are well described in Sechser (2004)'s quote, *"The desire for prestige, glory, and resources causes officers to advocate provocative offensive doctrines and high levels of military expenditure, whereas a proclivity for speed and finality in decision-making privileges military solutions over diplomacy and negotiation"* (p. 751). Militarism theory argues that military officers are more prone to favor policies that are more aggressive and in

favor of using force (Brodie, 1973). Also, military parochial interests raise the risk of war. The organizational interests of military officers may lead them to recommend military action more often and military interests favor offensive war-fighting doctrines, which increase the likelihood that force will be used in a crisis (Posen, 1984; Snyder, 1984).

Second, there will be increase in a number of officers holding top bureaucratic positions. Manifest Destiny Model is theorized by Finer (2002) and explains various interests of the military. The "manifest destiny" originally refers to the providential mission of the soldiers as the savior of their countries. In his model, the interests of the military shift from general (the defense of nation) to particular (personal career). In the section interests of the military, officers intervene in politics to improve their own personal careers such as holding top bureaucratic and administrative positions.

C. Theory: Military in Politics and Defense Policy

How does have the military in politics affect the defense policy? This study questions whether the involvement of the military in politics affects the defense policy. The available evidence on the relationship between the military in politics and the defense policy is largely based on country-level descriptive studies. This section develops a systematic and logical theory of military in politics and the defense policy based on the discussions previous section.

Figure 2-3 depicts the channels how the military in politics affect the defense policy. There are four reasons for military involvement in politics: 1) maintain of the military's share of national resources, 2) military wants to maintain its integrity, 3) fear of national disintegration, and 4) the extension of the concept of national security (N. Ball, 1981). The increase of military involvement affects the control of

the military, risks of war, and a number of officers holding the top bureaucratic position. In fact, this would inevitably affect the defense policy as Huntington (1957) stated in his book, "*Military is the principal institutional component of defense policy; it involves in the quantitative issues of the size, recruitment, and supply of the military forces, including the fundamental question of the proportion of state resources devoted to military needs*." As the military involvement increase, there will be 1) changes in control of the military, 2) increase of risks of war, and 3) increase in a number of officers or formal officers holding top bureaucratic positions. Sechser (2004) empirically showed that weak civilian control is considerably more aggressive.

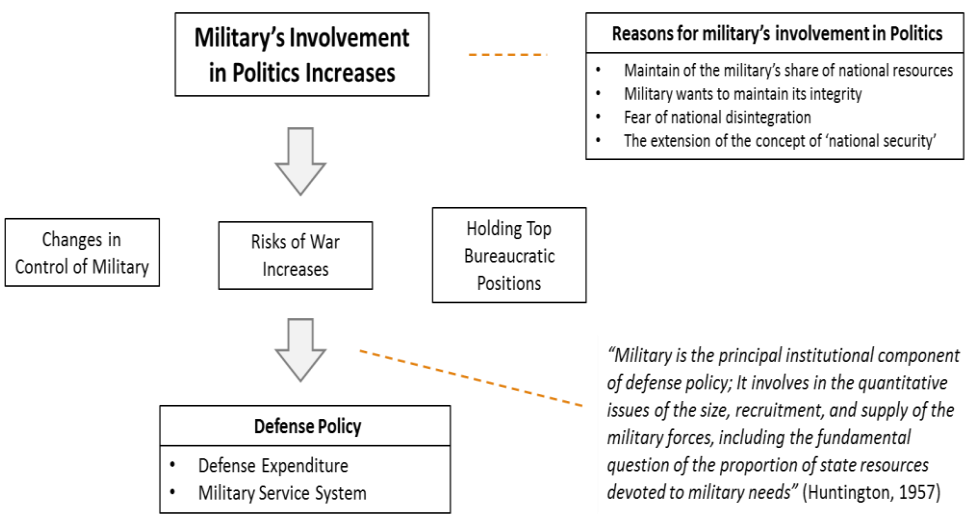

Figure 2-3 Channels of Military in Politics and Defense Policy: Theory Building

2.3. Relevant Literature

A. Demand for Defense Expenditure

The determinants of defense expenditure are studied thoroughly for a better understanding of its attribute. (Albalate et al., 2012; Batchelor et al., 2002; P. Dunne & Perlo-Freeman, 2003; Nincic & Cusack, 1979; Richardson, 1960) However, it is difficult to accounting for defense expenditure because many factors are intertwined and must be taken into consideration and all countries are under difference situations: threats posed by other countries, geographical and historical background, demographic factors, international relations such alliance and partner, domestic political situations, and political system.

There are two broad approaches to analyzing the demand for military spending (P. Dunne & Perlo-Freeman, 2003). The first group of study is based on Richardson's (1960) arms race model and the second group of study focuses on the economic, political and institutional determinant of military spending. Arms race model assumes that arms accumulate because of an interaction between two countries: conflict or rivalry situations between countries cause them to procure arms to use against one another and countries fear each other and procure arms to defend themselves against the others' weapons. However, this model is applicable when two countries are in conflict or rivalry, such as India-Pakistan, North Korea, South Korea, and the United States and China.

The second group of study takes various economic, political, and institutional factors into account when modeling for the determinants of military spending. As P. Dunne and Perlo-Freeman (2003) stated, "the most satisfactory empirical analyses

have tended to take a comprehensive approach, combining all of the plausible economic, political and military influences and operationalizing as many of them as possible" (p. 3), thus it is crucial to add key variables for better empirical estimations. Economical determinants of defense expenditure are population, foreign aid, GDP growth and GDP per capita, and government budget (Collier & Hoeffler, 2007; P. Dunne & Perlo-Freeman, 2003; Maizels & Nissanke, 1986; Özsoy, 2008). Political and institutional determinant of military spending are the military spending of neighboring countries, existence of war or civil war situations, degree of concentration of foreign arms, democracy, relative size of the government, and parliamentary system (Collier & Hoeffler, 2007; P. Dunne & Perlo-Freeman, 2003; Linz, 1994; Maizels & Nissanke, 1986).

This study follows the second approach and puts an emphasis on the institutional determinants of military spending while taking other economic and political factors into account. Furthermore, each country's military service system is carefully examined as a possible institutional determinant of military spending. To my knowledge, my investigation is the first empirical analysis using panel data relating military spending with the military service system. Bove and Cavatorta (2012) did a similar work and explored the impact of the transition to all-volunteer forces system on the shares of personnel, equipment, infrastructure, and other costs in NATO military expenditure, but did not find a significant result. Thus, this study supplements previous empirical evidence on institutional determinants of military spending.

There are numerous ways in which scholars theorized determinants of defense expenditure. Earlier studies examined the economic factors as the determinants of defense expenditure. (Olson & Zeckhauser, 1966; Smith, 1980; Thompson, 1979)

This line of research has begun with finding the discrepancy in defense burden among NATO allies, and Olson and Zeckhauser (1966) first attempted to find the determinant of common defense expenditure among allies. They found that the size of nations, measured by the Gross National Product (GNP), affects the size of nation's resources that they devote to the defense expenditure. Thompson (1979) also found that the nation's per capita income has the positive relationship with the defense expenditure because the higher a country's level of income leads to the greater the threat of enemy attack. Smith (1980) used a neoclassical approach which assumes social welfare function of civilian output and security to estimate the demand for defense expenditure. He found that, for some countries, defense expenditure is related to defense expenditure of other countries.

Although earlier studies, focusing on the economic determinants of defense expenditure, became a basis for future studies and provided important insights, it ignored political and institutional factors, which I think is more important. P. Dunne and Perlo-Freeman (2003) also mentioned that "in many countries, military expenditure is often independent of economic conditions and generated mainly by the internal logic of the state. The overall economic environment may provide a constraint on military burdens over time, but the importance of the strategic factors, security and threat perceptions, both internal and external, has to be recognized" (p.2-3). In his study, besides socio-economic factors, he considered international, political, and institutional factors into account. International factors were inter-state war, military expenditure of enemies, military spending of potential enemies, and military spending of all countries in security web; political factor was a civil war, military burden; institutional factor was the form of government; socio-economic factors were GNP and population. He also compared the determinant during the cold

war and post-cold war period. He found that all of the listed factors above were significant except GNP which is contradict to result from the previous studies. It is also worth note that population and democracy are negatively related to the defense expenditure.

Collier and Hoeffler (2007) considered neighbor's military expenditure and international aid received from other countries into account and found that those factors are significant determinants of military expenditure. He used GDP per capita for a proxy of economic opportunity and found a significantly positive association and reaffirmed that political and institutional factors such as inter-state and civil war, population, democracy are significant determinants of military expenditure. However, the population is positively related to the defense expenditure which is contradicting to the result from previous studies. Inter-state war and civil war were also positively related while a level of democracy was negatively related to the defense expenditure.

P. Dunne and Perlo-Freeman (2003) and Collier and Hoeffler (2007) yielded important insights, but the range of both studies are limited to developing countries. Yildirim and Sezgin (2005) and Albalate et al. (2012) expanded the range of countries and covered both developed and developed countries. Yildirim and Sezgin (2005) studied the relationship between democracy and military expenditure. In his model, the government consumption in a share of GNP, GNP, and armed forces were considered and military expenditure was specified as the ratio of military expenditure to GNP as well as the ratio of military spending to total government spending. He found that higher level of democracy is associated with lower level of military expenditure and argued that the result implies that democratic countries tend to resolve issues by nonviolent means. The government consumption in a share of GNP,

GNP, and armed forces were positively related to the military expenditure.

Albalate et al. (2012) examined the institutional factors more thoroughly and distinguished institutional factors as level of democracy, government form, electoral rules, and concentration of parliamentary parties. He also considered socio-economic (population and GDP per capita) and political factors (inter-state and civil war, alliance, freedom) into account. He found that government form and electoral rule are significant institutional determinants which mean that countries with a presidential democracy spend more on defense than countries with a parliamentary system and countries with a majoritarian voting system spend more on defense than countries with a proportional representation system. Population and democracy were negatively associated while GDP per capita, freedom, and alliance were positively associated with the defense expenditure.

It is interesting that there were some discrepancies in the results between studies. It is maybe caused by the different data, methodologies, and ranges or periods of research used, but it is still worth noting. Mixed results were found in two variables, GNP and population. GNP was found to be a significant factor and positively associated with the defense expenditure (Olson & Zeckhauser, 1966; Yildirim & Sezgin, 2005), but P. Dunne and Perlo-Freeman (2003) found that it is not a significant factor. Population was also found to be significant and both positively (Albalate et al., 2012; Collier & Hoeffler, 2007; Gonzalez & Mehay, 1990; Yildirim & Sezgin, 2005) and negatively (J. P. Dunne et al., 2008; P. Dunne & Perlo-Freeman, 2003) associated with the defense expenditure. Moreover, the results for some factors were consistently significant and indicated the same direction. Those factors were inter-state and civil war, either form of government or level of democracy, and neighbor's military expenditure, GDP per capita. Inter-state and civil war, neighbor's

military expenditure, and GDP per capita were positively associated with the defense expenditure, and a level of democracy was negatively associated with the defense expenditure.

Military expenditure was measured by using a percentage of GDP, the percentage of government spending, and real value at a constant price. GNI, GDP per capita, GNP per capita were used to measure a national income and GNP was used to measure a size of the nation. Dummy variables were used for inter-state and civil war, a form of government, alliance, institutional system. In this study, a percentage of GDP, GDP per capita and GNP are used to measure military expenditure, national income, and size of nation respectively.

B. Military Service System

The understanding of military service system is very important because all nations maintain the armed forces to protect its nation and people from external and internal threats or aggressors. The military power is generated and consists of the quality and quantity of manpower, the quantity and quality of weapons, the quantity and quality of logistics, the level of operation plans and tactical plans, the level of organizational structure, and the ability of command and control etc. The manpower is one of the most important aspects in generating military power because the manpower is a main body of operation that without well-trained and enough personnel, the state of the art weapon and technology becomes ineffective.

Although all nations employ some professional volunteer officers and soldiers in their military, how the military service is imposed to its citizens, how its military is recruiting the military personnel, and the ratio of volunteer forces and drafted forces vary depending on the military service system. C. Mulligan and Shleifer (2005) have

noted that "Prior to Napoleon, armies were typically staffed by voluntary enlistments or by impressments – the forced recruitment of individuals with little or no compensation or regulation of service terms or length" (p. 3). However, the monarchy and caste system fell and the democracy became powerful after the French revolution, and this transition also brought changes in the military service system, especially how citizens perceive military service. In a democracy, the citizens become main agents of defending its nation and people from threats and invasions by neighboring countries.

In general, the military service system can be categorized as follows: 1) all volunteer forces system, 2) the conscription or mandatory service system, and 3) the hybrid system that has both volunteer forces system and conscription or draft military system. All volunteer forces system relies fully on the volunteering recruitment rather than conscription or mandatory service. In contrast, the conscription or mandatory service system imposes the military duty to its citizen and derives its manpower compulsively. Although the countries have the conscription or mandatory service system, it does not mean that all military personnel is derived compulsively; the countries also employ some permanent and professional volunteer officers in their military. The mandatory service period varies from country to country depending on the country's security environments. Finally, the hybrid system is the mixture of both volunteer forces system and mandatory military system, and there can be many different types of this system. For instance, China employs the conscription system but not all male is obligated to join the military, whereas, the United States, technically with all volunteer system, has the selective service system which enforces all men between 18 to 25 to register with the system in case of emergency so that they can be conscripted if necessary.

A recent study shows that the mandatory military service system has declined world-widely since 1970 (Tarabar & Hall, 2016). Table 2-2 depicts the increase in the all-volunteer forces system to the conscription system ratio from 0.28 in 1970 to 1.48 in 2014, showing a significant reduction in the use of conscription system over this period.

Table 2-2 The decline in conscription, 1970 – 2014

Year	All-volunteer (A)	Conscription (B)	Unspecified[1]	(A) / (B) ratio
1970	17	61	81	0.28
1975	48	55	56	0.87
1980	52	58	49	0.90
1985	49	65	45	0.75
1990	50	69	40	0.72
1995	56	67	36	0.84
2000	61	62	36	0.98
2005	71	70	18	1.01
2010	90	63	6	1.43
2014	95	64	0	1.48

Source: 2015 Economic Freedom Dataset, Publisher Fraser Institute

The changeover from the conscription system to all-volunteer forces system has occurred gradually, marked by sequential shortenings of military service obligation period and increase of volunteer forces, armed forces' downsizing, and weapon system advancement. Tarabar and Hall (2016) noted that *"for example, Poland (a NATO member since 1999) had a compulsory military service term of 2 years during the Cold War and still required service of 12 months as late as 2005. In that year,*

[1] There are 159 countries in data, but number of countries for which data is available varies by year.

conscriptees' service obligations were reduced to 9 months until the draft ultimately was phased-out in 2009" (p. 56).

Furthermore, the downsizing and restructuring trends of the military were prominently made in the European countries during the NATO integration process (Bove & Cavatorta, 2012; Jehn & Selden, 2002). As depicted in Table 2-3, among twenty-eight NATO member countries, only six countries have maintained the conscription system, twenty countries have abolished and suspended the conscription system, and two countries never had the conscription system. It is prominent that the changeover of the military service system had occurred particularly in the 2000s; eleven countries have joined NATO during that period.

Table 2-3 NATO member military service system (with or without the conscription)

Country	Abolished / Suspended	Year Joined
United Kingdom	Abolished 1960	1949
Luxembourg	Abolished 1967	1949
United States	Suspended 1979	1949
Netherlands	Suspended 1992	1949
Belgium	Suspended 1994	1949
France	Suspended 2001	1949
Spain	Abolished 2001	1982
Slovenia	Abolished 2003	2004
Portugal	Abolished 2004	1949
Czech Republic	Abolished 2004	1999
Hungary	Abolished 2004	1999
Italy	Abolished 2005	1949
Romania	Suspended 2006	2004
Slovakia	Abolished 2006	2004
Latvia	Abolished 2007	2004
Poland	Suspended 2008	1999
Bulgaria	Abolished 2008	2004
Lithuania	Suspended 2008	2004
Croatia	Abolished 2008	2009
Albania	Abolished 2010	2009
Canada	No Conscription	1949
Iceland	No Conscription	1949
Denmark	Compulsory	1949
Norway	Compulsory	1949
Greece	Compulsory	1952
Turkey	Compulsory	1952
Germany	Compulsory	1955
Estonia	Compulsory	2004

Source: Bove and Cavatorta (2011), CIA The World Factbook; NATO.

Many scholars in various fields looked into this phenomenon with different

approaches. Scholars in public policy and political science studied the history of conscription system and its transition to the all-volunteer forces system in the United States (Cooper, 1977), debate over the advantage and disadvantage of each system (Poutvaara & Wagener, 2007), the determinant of changeover from the conscription to all-volunteer forces (Adam, 2012; Jehn & Selden, 2002; C. Mulligan & Shleifer, 2005; Tarabar & Hall, 2016). The economists looked at the economic benefits and costs of the changeover from the conscription to all-volunteer forces (Fisher, 1969; Lau, Poutvaara, & Wagener, 2004; Warner & Asch, 2001).

However, the determinant of the changeover from the conscription to all-volunteer forces has not been studied yet. Thus, I argue that the military in politics is an important determinant of the military service system. In this study, the military service system is categorized into two groups: 1) all volunteer forces system and 2) the conscription or mandatory service system. Some countries that have a hybrid system are evaluated and categorized as either all-volunteer forces system or conscription system by author's judgment. The United States is categorized as all-volunteer forces system, and China, on the other hands, is categorized as conscription system.

2.4. Empirical Strategy: Data, Variables and Models

A. Data and Variables

I have constructed a balanced panel data set covering 129 countries for the period from 1984 to 2013. The countries considered are those for which both the military in politics information and military expenditure information exists in the ICRG and

SIPRI database. The data for this chapter come from various sources as organized in Table 2-4.

First, the independent variable, the military in politics, measures the involvement of the military in politics and is from the International Country Risk Guide (ICRG)[2] which is very commonly used in academia since its first publication in 1984. Howell (2011) states that "s*ince the military is not elected, involvement, even at a peripheral level, diminishes democratic accountability. Military involvement might stem from an external or internal threat, be symptomatic of underlying difficulties, or be a full-scale military takeover. Over the long term, a system of military government will almost certainly diminish effective governmental functioning."* The military in politics variable uses 7 points scales, with the highest number of points (6) indicating the highest military involvement level and the lowest number (0) indicating the lowest military involvement level.

The dependent variables are the defense expenditure and military service system. The defense expenditure data come from the Stockholm International Peace Research Institute (SIPRI). SIPRI has produced very reliable defense sector data since 1949 and it contains consistent time series on the defense expenditure. In this paper, the defense expenditure variables measured as a percentage of GDP and percentage of government expenditure are used for analysis. The military service system variable is constructed as dummy variable by the author using CIA Factbook and other sources. If the country has conscription system, then it has a value of 1 and

[2] The developer of PRS data, Howell (1998), stated that "most data in country and political risk is what we call expert data (and not, as is often asserted, just opinion)" and argued "expert data is systematically derived from country specialists with high levels of training and decades of experience."

if the country has All-Volunteer Force System (AVF), then it has a value of 0.

The control variables are the gross domestic product (GDP) per capita, population, population age between 15-29, government expenditure, size of the military, democracy, and previous war experience. The data for GDP per capita, population, population age between 15-29, and government expenditure are from the world development indication (WDI)[3] provided the World Bank. The GDP per capital uses the constant 2010 U.S. dollar price. The natural log value is taken for the GDP per capita, population and population age between 15-29, and the government expenditure is measured as a percentage of the GDP.

The military personnel variable is from the military balance published by the International Institute for Strategic Studies (IISS)[4]. It measures the total number of armed forces and takes the natural log value. Lastly, variables for democracy and previous war are from the polity VI project[5]. I have constructed dummy variables based on the polity VI data: the democracy variable takes the value of 1 if the democratic country and 0 if the authoritarian country and the previous war variable takes the value of 1 if the country has been involved in a war previously and 0 if the country has not been involved in a war.

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[3] The World Development Indicators (WDI) is the primary World Bank collection of development indicators, compiled from officially recognized international sources. It presents the most current and accurate global development data available, and includes national, regional and global estimates. (World bank, retrieved February 22, 2018)

[4] The Military Balance contains region-by-region analysis of the major military and economic developments affecting defense and security policies, and the trade in weapons and other military equipment. (IISS website, retrieved February 22, 2018)

[5] Polity IV project provides political regime characteristic and transitions for 167 countries for the period 1946-2013. It is directed by Monty G. Marshall, the principal investigator at Societal-Systems Research Inc, and Ted Robert Gurr, the founder, from University of Maryland (Emeritus).

Table 2-4 List of variables and its measurement

Variables		Measurement	Definition	Source
Independent Variable	Military in Politics	Low - High (0 – 6)	Involvement of the military in politics	International Country Risk Guide (ICRG)
Dependent Variable	Defense Expenditure	% of GDP	Data for Defense Expenditure as a percentage of GDP	Stockholm International Peace Research Institute (SIPRI)
		% of Gov't Expenditure	Data for Defense Expenditure as a percentage Government Expenditure	
	Military Service System	Dummy Variable	A dummy variable taking the value of 1 if conscription system and 0 if All-Volunteer Force System	Author's own
Control Variable	GDP per Capita	Ln GDP per capita	Measured as GDP per capita (US $ 2010 constant)	World Development Indicator
	Population	Ln Population	Total Population	
	Population 15-29	Ln Population	Population between age 15 to 29	
	Government Expenditure	% of GDP	Government Expenditure as a percentage of GDP	
	Military Personnel	Ln # of Armed Forces	Total Number of Armed Forces	The Military Balance (IISS)
	Democracy	Dummy variable	A dummy variable taking the value of 1 if the democratic country and 0 if the authoritarian country	Polity IV
	Previous War	Dummy Variable	A dummy variable taking the value of 1 if the country has been involved in a war previously 0 if the country has not been involved in a war	

B. Empirical Model

This paper conducts the empirical analysis using a panel data for 129 countries for the period from 1984 to 203. A panel data has both a cross-sectional dimension, indicated by the subscript, *i,* and a time series dimension, indicated by subscript *t.* Unlike a cross-sectional data which is static, it enables the researcher to analyze data more precisely considering unobserved heterogeneity factors. The panel data analysis captures dynamic relationships and improves the efficiency of econometric estimation (Hsiao, 2007). The basic panel data model can be represented as follow:

$$Y_{it} = \alpha + \beta x_{it} + \delta_i + \epsilon_{it}$$

Here, Y is a dependent variable observed for individual i at time t, α is a constant, β is a regression coefficient, x is an independent variable, δ is an individual-specific and time-invariant effect which are fixed over time, ϵ is an error term.

Three different estimation methods, pooled-OSL estimation, random effect estimation, and fixed-effect estimation, are used for the analysis and cross-validation. The pooled-OSL estimation is the easiest way but it ignores the panel structure of data. It is also likely to have two specification problems, that the pooled OLS estimator is not efficient, biased, and inconsistent because of omitted variables and correlation with other regressors (Schmidheiny & Basel, 2011). The random-effect and fixed-effect estimations are useful for the analysis of panel data, complementing the problem of the pooled-OLS estimation. The difference between two estimations is whether the time-invariant effect is controlled or not. The fixed effect estimation controls the individual-specific and time-invariant effect, whereas, in the random

effect estimation, the individual-specific effect is a random variable. The estimators of both estimations are unbiased and efficient.

The advantage of the fixed effect estimation is that it has a classical error term, but it uses too many dummy variables for each cross-section. On the other hands, the random effect estimation does not use many dummy variables, and thus, the estimator is more efficient compared to the estimator from the fixed effect. However, unlike in the fixed effect estimation, the error component can be correlated with regressors and their coefficients can be biased. The Hausman test (Hausman, 1978) is conducted for selecting between the fixed effect estimation and random effect estimation. The basic idea of the Hausman test is to compare the difference between the estimators of the fixed effect estimation and random effect estimation to test whether there is a significant difference. More specifically, it compares and tests the estimator $\widehat{\theta_1}$ from the random effect and the estimator $\widehat{\theta_2}$ from the fixed effect by setting the null hypothesis that is there is no significant difference between two estimators. If the null hypothesis is rejected, then the fixed effect estimation should be selected.

There are three analysis models and their dependent variables are the defense expenditure and military service system. The model 1 and 2 are for the defense expenditure as it is measured using both the percentage of GDP and percentage of government expenditure. The model 1 and 2 are basically the same except for the dependent variables. They are based on the standard models of the determinants of the defense expenditure (Albalate et al., 2012; Collier & Hoeffler, 2006; J. P. Dunne et al., 2008; P. Dunne & Perlo-Freeman, 2003) which include threat variable, socioeconomic variables, and democracy variable. Nonetheless, I also add the total number of armed-forces variable and the ratio of government expenditure to GDP,

the former proxies for pressures on the government's wage bill and latter is routinely used as a control variable in the defense expenditure equation (Gupta et al., 2001)

In model 3, the control variables are as follow. Previous war variable is a country's perceived threats and is an indicator of a regional tension. The GDP per capita measures the country's level of economic development. The population and population age between 15-29, and a total number of armed-forces are considered both a supply and demand side of manpower. If there is a low supply of manpower, it would be difficult to keep the conscription system. On the other hand, the conscription system is preferred and likely to be kept if there is a high demand of manpower by the military. Lastly, the democracy variable measures the country's level of competitiveness of political participation.

Model 1: The defense Expenditure (% of GDP)

$$\text{Defense Expenditure}_{i,t} = \alpha_0 + \beta_1(\text{Mil\_Pol})_{i,t} + \beta_2(\text{PW})_{i,t} + \beta_3(\text{LnGDPP})_{i,t} + \beta_4(\text{LnPOP})_{i,t} + \beta_5(\text{Govt\_Exp\_GDP})_{i,t} + \beta_6(\text{LnArmed})_{i,t} + \beta_7(\text{Demo})_{i,t} + \delta_i + \varepsilon_{i,t}$$

$Mil\_Pol_{i,t}$= Military in Politics

$PW_{i,t}$= Previous war

$LnGDPP_{i,t}$= ln(GDP per capita)

$LnPOP_{i,t}$= ln(Population)

$Govt\_Exp\_GDP_{i,t}$= Government expenditure as a percentage of GDP

$LnArmed_{i,t}$= ln(Total number of armed-forces)

$Demo_{i,t}$= Democracy

δ_i = Individual-specific variable

$\varepsilon_{i,t}$ = Error term

Model 2: The defense Expenditure (% of Government Expenditure)

$$\text{Defense Expenditure}_{i,t} = \alpha_0 + \beta_1(\text{Mil\_Pol})_{i,t} + \beta_2(\text{PW})_{i,t} + \beta_3(\text{LnGDPP})_{i,t} + \beta_4(\text{LnPOP})_{i,t} + \beta_5(\text{Govt\_Exp\_GDP})_{i,t} + \beta_6(\text{LnArmed})_{i,t} + \beta_7(\text{Demo})_{i,t} + \delta_i + \varepsilon_{i,t}$$

$Mil\_Pol_{i,t}$= Military in Politics

$PW_{i,t}$= Previous war

$LnGDPP_{i,t}$= ln(Gross Domestic Product per capita)

$LnPOP_{i,t}$= ln(Population)

$Govt\_Exp\_GDP_{i,t}$= Government expenditure as a percentage of GDP

$LnArmed_{i,t}$= ln(Total number of armed-forces)

$Demo_{i,t}$= Democracy

δ_i = Individual-specific variable

$\varepsilon_{i,t}$ = Error term

Model 3: The military service system (1 = Conscription)

$$\text{Conscription}_{i,t} = \alpha_0 + \beta_1(\text{Mil\_Pol})_{i,t} + \beta_2(\text{PW})_{i,t} + \beta_3(\text{LnGDPP})_{i,t} + \beta_4(\text{LnPOP})_{i,t} + \beta_5(\text{LnPOP1519})_{i,t} + \beta_6(\text{LnArmed})_{i,t} + \beta_7(\text{Demo})_{i,t} + \delta_i + \varepsilon_{i,t}$$

$Mil\_Pol_{i,t}$= Military in Politics

$PW_{i,t}$= Previous war

$LnGDPP_{i,t}$= ln(Gross Domestic Product per capita)

$LnPOP_{i,t}$= ln(Population)

$\mathrm{LnPOP1519}_{i,t}$= ln(Population age between 15-19)

$LnArmed_{i,t}$= ln(Total number of armed-forces)

$Demo_{i,t}$= Democracy

δ_i = Individual-specific variable

$\varepsilon_{i,t}$ = Error term

C. The Dynamic Panel estimation for Robustness Check

The dynamic panel estimation is conducted for further robustness check. The estimator from the dynamic panel estimation is more consistent for panel data with small time periods, 'small T,' and many individual units, 'large N.' The dynamic panel estimation includes lagged levels of the dependent variable as regressors, and it can be represented as follow:

$$Y_{it} = \alpha + Y_{it-1} + \beta x_{it} + \delta_i + \epsilon_{it}$$

Y is a dependent variable observed for individual i at time t, α is a constant, β is a regression coefficient, x is an independent variable, δ is an individual-specific and time-invariant effect which are fixed over time, ϵ is an error term. However, in dynamic panel estimation, both the fixed effect and random effect cannot be used. Nickell (1981) has shown that the fixed effect creates a bias in the

estimate of the coefficient of the lagged dependent variable. Within transformation process which subtracts the individual's mean value of y and each x from the respective variable inevitably creates a correlation between the explanatory variable and error term. The mean of the lagged dependent variable contains observations 0 through (T − 1) on y, and the mean error, which is being conceptually subtracted from each ϵ_{it}, contains contemporaneous values of ϵ for t = 1 . . . T. Moreover, in the random effect estimation, the lagged dependent variable contains δ_i, an individual-specific and time-invariant effect which is fixed over time. Consequently, Cov(Y_{it-1}, δ_i) $\neq 0$ because both error term and the explanatory variable contain δ_i, and it does not satisfy the basic assumption of the random effect estimation, Cov(x_{it}, δ_i)= 0. The random effect cannot be used in dynamic panel estimation.

In the dynamic panel estimation, where the lagged dependent variable is included, generalized method moments (GMM) should be used for analysis. Arellano and Bond (1991) have first developed difference GMM method for the dynamic panel analysis and Windmeijer (2005) later has developed system GMM which is widely used in recent works. In the system GMM, the consistency of estimator depends on the validity of the instruments. Thus, following two specification tests are preferred. The first is a Hansen J-test of over-identifying restrictions, which tests the overall validity of the instruments and the second is the Arellano-Bond test for autocorrelation (Woo & Kumar, 2015). Moreover, the two-step system GMM requires to use the robust error (Windmeijer, 2005), otherwise, the estimator is not a consistent estimator and biased.

Therefore, in this paper, the two-step system GMM is used for the dynamic panel analysis and robustness check of the model 1 and 2 only. As discussed above, both Hansen J-test of over-identifying restrictions and Arellano-Bond test will be

conducted and the robust error will be used for the analysis. The model 4 and model 5 represent the estimation equation used for the dynamic panel analysis.

Model 4 The Defense Expenditure (% of GDP)

$$\text{Defense Expenditure}_{i,t} = \alpha_0 + \beta_1(\text{DE})_{i,t-1} + \beta_1(\text{Mil}_{\text{Pol}})_{i,t} + \beta_2(\text{PW})_{i,t} + \beta_3(\text{LnGDPP})_{i,t} + \beta_4(\text{LnPOP})_{i,t} + \beta_5(\text{Govt\_Exp\_GDP})_{i,t} + \beta_6(\text{LnArmed})_{i,t} + \beta_7(\text{Demo})_{i,t} + \delta_i + \varepsilon_{i,t}$$

$\text{DE}_{i,t-1}$= The lagged defense expenditure

$Mil\_Pol_{i,t}$= Military in Politics

$PW_{i,t}$= Previous war

$LnGDPP_{i,t}$= ln(GDP per capita)

$LnPOP_{i,t}$= ln(Population)

$Govt\_Exp\_GDP_{i,t}$= Government expenditure as a percentage of GDP

$LnArmed_{i,t}$= ln(Total number of armed-forces)

$Demo_{i,t}$= Democracy

δ_i = Individual-specific variable

$\varepsilon_{i,t}$ = Error term

Model 5 The Defense Expenditure (% of government expenditure)

$$\text{Defense Expenditure}_{i,t} = \alpha_0 + \beta_1(\text{DE})_{i,t-1} + \beta_1(\text{Mil}_{\text{Pol}})_{i,t} + \beta_2(\text{PW})_{i,t} + \beta_3(\text{LnGDPP})_{i,t} + \beta_4(\text{LnPOP})_{i,t} + \beta_5(\text{Govt\_Exp\_GDP})_{i,t} + \beta_6(\text{LnArmed})_{i,t} + \beta_7(\text{Demo})_{i,t} + \delta_i + \varepsilon_{i,t}$$

$\text{DE}_{i,t-1}$= The lagged defense expenditure

$Mil\_Pol_{i,t}$= Military in Politics

$PW_{i,t}$= Previous war

$LnGDPP_{i,t}$= ln(GDP per capita)

$LnPOP_{i,t}$= ln(Population)

$Govt\_Exp\_GDP_{i,t}$= Government expenditure as a percentage of GDP

$LnArmed_{i,t}$= ln(Total number of armed-forces)

$Demo_{i,t}$= Democracy

δ_i = Individual-specific variable

$\varepsilon_{i,t}$ = Error term

2.5. Empirical Results

A. Basic Analysis Result

Table 2-5 describes the variables for countries from 1984 to 2013. Based on the empirical model, 129 countries are subject to analysis, but the analysis of up to 134 countries is shown in descriptive statistics. The mean, standard deviation, minimum, and maximum of variables are displayed, and upper case 'N' represents total observations, low case 'n' represents a total number of country, and Year refers to the average observation periods. Of these values, the meaning of the standard deviation is important, and there are three different standard deviations in panel data. First one is a between standard deviation, which is the difference between the countries that are analyzed. The second one is a within the standard deviation, which is a variation that changes over time in one country. The third one is an overall standard deviation, which is a variation of all of the data points in the panel data.

Typically, a deviation between countries is larger than a deviation within a country, which means that there is a greater deviation of data across countries than data deviations within a country over time. Nonetheless, a deviation between countries for the defense expenditure and previous war variables is smaller than a deviation within a country. In addition, the ratio of the standard deviation within the country to the standard deviation between countries provides a better understanding the nature of the data. The population variable has the lowest ratio of the standard deviation within the country to the standard deviation between countries. Whereas, the previous war variable has the highest ratio of the standard deviation within the country to the standard deviation between countries.

For the defense expenditure variable, the between countries standard deviation is 2.24 and the within-country standard deviation is 2.99 and the ratio is 1.33. The military service system variable has the between countries standard deviation of 0.45 and the within-country standard deviation of 0.21 and the ratio of 0.48. The military in politics variable has the between countries standard deviation of 1.61 and the within-country standard deviation of 0.80 and the ratio of 0.49. The previous war variable has the between countries standard deviation of 0.066 and the within-country standard deviation of 0.142 and the ratio of 2.14. The population variable has the between countries standard deviation of 1.50 and the within-country standard deviation of 0.17 and the ratio of 0.11. The population age between 15-29 variable has the between countries standard deviation of 1.50 and the within-country standard deviation of 0.20 and the ratio of 0.13. The GDP per capita variable has the between countries standard deviation of 1.53 and the within-country standard deviation of 0.24 and the ratio of 0.15. The government expenditure variable has the between countries standard deviation of 5.16 and the within-country standard deviation of

3.47 and the ratio of 0.67. The size of the military has the between countries standard deviation of 1.61 and the within-country standard deviation of 0.37 and the ratio of 0.22. The democracy variable has the between countries standard deviation of 0.39 and the within-country standard deviation of 0.27 and the ratio of 0.69.

Table 2-6 shows the correlation analysis result. The correlation between the dependent variables and other variables is as follows. First, the dependent variable, the defense expenditure as a percentage of GDP, has a positive correlation with the independent variable, the military in politics, and its correlation coefficient is 0.0454. It also has a positive correlation with the control variable, government expenditure, military personnel, and GDP per capita, and their correlation coefficients are 0.288, 0.242, and 0.102 respectively. On the other hand, the defense expenditure as a percentage of GDP has a negative correlation with democracy and population, and their correlation coefficients are -0.388, and -0.0635 respectively. Second, the dependent variable, the defense expenditure as a percentage of government expenditure, has a positive correlation with the independent variable, the military in politics, and its correlation coefficient is 0.269. It also has a positive correlation with the control variables, population and military personnel, and their correlation coefficients are 0.0508, and 0.287 respectively. On the other hand, the defense expenditure as a percentage of government expenditure has a negative correlation with democracy, government expenditure, and GDP per capita, and their correlation coefficients are -0.506, -0.0571, and -0.133 respectively. The results show that the defense expenditure, both in terms of a percentage of GDP and a percentage of government expenditure, has a positive relationship with the military in politics and size of military personnel, but it has a negative relationship with democracy. It is interesting that the results for socio-economic variables are mixed. Third, the last

dependent variable, the conscription, also has a positive correlation with the independent variable, the military in politics, and its correlation coefficient is 0.101. It has a positive correlation with control variables, population, military personnel, and population age 15-29, and their correlation coefficients are 0.0438, 0.208, and 0.0323, respectively. On the other hand, it has a negative correlation with democracy and government expenditure, their correlation coefficients are -0.00171 and -0.00607 respectively.

Table 2-5 Descriptive Statistics

Variable		Mean	S.D	Min	Max	Observations
Defense Expenditure (% of GDP)	overall	2.68518	3.76922	0	117.388	N=3450
	between		2.24106	0	14.1404	n=133
	within		2.99136	-7.0453	107.336	Year=25.9398
Military Service System (1=conscription)	overall	0.53458	0.49887	0	1	N=4020
	between		0.45029	0	1	n=134
	within		0.2181	-0.3988	1.30124	T=30
Military in Politics	overall	2.33018	1.81821	0	6	N=3760
	between		1.61636	0	5.686	n=134
	within		0.80236	-0.3991	6.36918	Year=28.0597
Previous War	overall	0.02537	0.15728	0	1	N=4020
	between		0.06644	0	0.46667	n=134
	within		0.14267	-0.4413	0.99204	T=30
Ln Population	overall	16.2453	1.50832	12.741	21.0288	N=4011
	between		1.50224	12.9737	20.9245	n=134
	within		0.17842	15.3523	17.4073	Year=29.9328
Ln Population (Age 15-29)	overall	14.199	1.51156	10.6194	19.0228	N=4011
	between		1.50253	10.6837	18.9513	n=134
	within		0.2015	13.2981	15.6771	Year=29.9328
Ln GDP per Capita	overall	8.38407	1.56251	4.75181	11.626	N=3732
	between		1.53495	5.4235	11.3008	n=132
	within		0.24502	7.16887	9.64426	Year=28.2727
Government Expenditure (% of GDP)	overall	15.9397	6.20683	0	76.2221	N=3634
	between		5.16409	4.78889	32.1678	n=133
	within		3.47778	-0.1629	66.163	Year=27.3233
Size of the military	overall	10.8752	1.65476	3.91202	15.235	N=3343
	between		1.61319	6.81876	15.0506	n=134
	within		0.37033	6.71776	12.772	Year=24.9478
Democracy	overall	0.64901	0.47734	0	1	N=4020
	between		0.39234	0	1	n=134
	within		0.27393	-0.3177	1.61567	T=30

Table 2-6 Correlation Analysis Result

	Military in Politics	Defense Expenditure (% of GDP)	Defense Expenditure (% of Gov't)	Conscription	Previous War	Population	Population (15-29)	GDP per capita	Government Expenditure (% of GDP)	Military Personnel	Democracy
Military in Politics	1										
Defense Expenditure (% of GDP)	0.0454*	1									
Defense Expenditure (% of Gov't)	0.269***	0.851***	1								
Conscription	0.101***	-0.00529	0.00734	1							
Previous War	0.0274	0.0929***	0.109***	-0.0699***	1						
Population	0.185***	-0.0635**	0.0508*	0.0438*	0.161***	1					
Population (15-29)	0.237***	-0.0316	0.0963***	0.0323	0.162***	0.993***	1				
GDP per Capita	-0.685***	0.102***	-0.133***	-0.00629	-0.0273	-0.176***	-0.232***	1			
Government Expenditure (% of GDP)	-0.469***	0.288***	-0.0571**	-0.00607	-0.0119	-0.224***	-0.264***	0.444***	1		
Military Personnel	0.0769***	0.242***	0.287***	0.208***	0.158***	0.825***	0.819***	0.094***	-0.0934***	1	
Democracy	-0.311***	-0.388***	-0.506***	-0.00171	0.0175	-0.0110	-0.0571**	0.250***	0.0837***	-0.076***	1

* $p < 0.05$, ** $p < 001$, *** $p < 0.001$

B. Estimation Results

(1) The military in politics and the defense expenditure

In this chapter, the defense expenditure is measured using two different measurements: the defense expenditure as a percentage of GDP and as a percentage of government expenditure. Table 2-9 presents the results of the estimation of Model 1 in which the ratio of defense expenditure to GDP is used as the dependent variable. First, in pooled OSL model (1), the military in politics has a positive sign (0.240) and is statistically significant at the 1%. The point estimate suggests that 1-point increase in the military in politics level is associated with an increase in the defense expenditure as a share of GDP of 0.24%. The threat factor, previous war, has a positive (1.061) and is statistically significant at the 1%. The socio-economic factors, population and GDP per capita, are negatively associated with the defense expenditure at the 1% significant level. The size of military personnel and the government expenditure have positive signs and are statistically significant at the 1%. Lastly, the result shows that democracy has a negative sign (-0.977) and statistically significant relation with the defense expenditure.

Second, in random effect model (2), the military in politics has a positive sign (0.201) and is statistically significant at the 1%. The point estimate suggests that 1-point increase in the military in politics level is associated with an increase in the defense expenditure as a share of GDP of 0.201%. The threat factor, previous war, has found to be insignificant with a positive sign. The socio-economic factors, population and GDP per capita, are negatively associated with the defense expenditure at the 1% significant level. The size of military personnel and the government expenditure have positive signs and are statistically significant at the 1%. Lastly, the result shows that democracy has a negative sign (-0.465) and

statistically significant relation with the defense expenditure.

Third, in fixed effect model (3), the military in politics has a positive sign (0.202) and is statistically significant at the 1%. The point estimate suggests that 1-point increase in the military in politics level is associated with an increase in the defense expenditure as a share of GDP of 0.202%. The threat factor, previous war, has found to be insignificant with a positive sign. The socio-economic factors, population and GDP per capita, are negatively associated with the defense expenditure at the 1% significant level. The size of military personnel and the government expenditure have positive signs and are statistically significant at the 1%. Lastly, the result shows that democracy is not statistically significant with the defense expenditure.

Table 2-10 presents the results of the estimation of Model 2 in which the ratio of defense expenditure to government expenditure is used as the dependent variable. First, in pooled OSL model (1), the military in politics has a positive sign (0.439) and is statistically significant at the 1%. The point estimate suggests that 1-point increase in the military in politics level is associated with an increase in the defense expenditure as a share of government expenditure of 0.439%. The threat factor, previous war, has a positive (3.983) and is statistically significant at the 1%. The socio-economic factors, population and GDP per capita, are negatively associated with the defense expenditure at the 1% significant level. The size of military personnel and the government expenditure have positive signs and are statistically significant at the 1%. Lastly, the result shows that democracy has a negative sign (-5.343) and statistically significant relation with the defense expenditure.

Second, in random effect model (2), the military in politics has a positive sign (0.537) and is statistically significant at the 1%. The point estimate suggests that 1-point increase in the military in politics level is associated with an increase in the

defense expenditure as a share of government expenditure of 0.537%. The threat factor, previous war, has found to be significant at 1% level with a positive sign. The socio-economic factors, population and GDP per capita, are negatively associated with the defense expenditure at the 1% significant level. The size of military personnel and the government expenditure have positive signs and are statistically significant at the 1%. Lastly, the result shows that democracy has a negative sign (-0.538) and statistically significant relation with the defense expenditure.

Third, in fixed effect model (3), the military in politics has a positive sign (0.599) and is statistically significant at the 1%. The point estimate suggests that 1-point increase in the military in politics level is associated with an increase in the defense expenditure as a share of government expenditure of 0.599%. The threat factor, previous war, has found to be insignificant with a positive sign. The socio-economic factors, population and GDP per capita, are negatively associated with the defense expenditure at the 1% significant level. The size of military personnel and the government expenditure have positive signs and are statistically significant at the 1%. Lastly, the result shows that democracy is not statistically significant with the defense expenditure.

Overall, the estimation results suggest that a higher level of the military in politics is associated with an increase in the defense expenditure. It implies that the military in politics is a very significant determinant of defense expenditure. This result is consistent across all models presented. For both model 1 and model 2, the Hausman test results reject the null hypothesis at significant level 1%, suggesting that the fixed effect models are better suited to model the data. Table 2-7 shows the summary of fixed effect model result.

Table 2-7 Fixed Effect Model Result of Model 1 & 2

Variables	Relationship with the Defense Expenditure
Military in Politics	Positive***
Previous War	Positive, but not significant
Population	Negative***
GDP per Capita	Negative***
Government Expenditure % of GDP	Positive***
Size of the military	Positive***
Democracy	Positive, but not significant

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

(2) The military in politics and military service system

Table 2-11 presents the results of the estimation of model 3 in which the conscription is used as the dependent variable. First, in pooled OSL model (1), the military in politics has a positive sign (0.025) and is statistically significant at the 1%. A higher the military in politics level, the countries are more likely to have the conscription system. The threat factor, previous war, has a negative (-0.271) and is statistically significant at the 1%. The socio-economic factors, the population is positively associated with the conscription system, but population age 15-29 is negatively associated at the 1% significant level. The size of military personnel and the GDP per capita have positive signs and are statistically significant at the 1%. Lastly, the result shows that democracy has a positive sign (0.0685) and statistically significant relation with the conscription system.

Second, in random effect model (2), the military in politics has a positive sign (0.0226) and is statistically significant at the 1%. A higher the military in politics level, the countries are more likely to have the conscription system. The threat factor,

previous war, has a positive (0.0807) and is statistically significant at the 1%. The socio-economic factors, the population is negatively associated with the conscription system, but population age 15-29 is positively associated at the 1% significant level. The size of military personnel has a positive sign (0.117) and GDP per capita has a negative sign (-0.0635), and they are statistically significant at the 1%. Lastly, the result shows that democracy is not statistically significant with the conscription system.

Third, in fixed effect model (3), the military in politics has a positive sign (0.0253) and is statistically significant at the 1%. A higher the military in politics level, the countries are more likely to have the conscription system. The threat factor, previous war, has a positive (0.0750) and is statistically significant at the 1%. The socio-economic factors, the population is negatively associated with the conscription system, but population age 15-29 is positively associated at the 1% significant level. The size of military personnel has a positive sign (0.0949) and GDP per capita has a negative sign (-0.0977), and they are statistically significant at the 1%. Lastly, the result shows that democracy is not statistically significant with the conscription system.

Overall, the estimation results suggest that the countries with a high level of the military in politics are more likely to have conscription system. This result is consistent across all models presented. The Hausman test result rejects the null hypothesis at significant level 1%, suggesting that the fixed effect model is better suited to model the data. Table 2-8 presents the summary of fixed effect result.

Table 2-8 Fixed Effect Model Result of Model 3

Variables	**Relationship with the Conscription**
Military in Politics	Positive***
Previous War	Positive***
Population	Negative***
Population (Age 15 – 30)	Positive***
GDP per Capita	Negative***
Size of the military	Positive***
Democracy	Negative, but not significant

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 2-9 Estimation result of Model 1

(Dependent Variable: The Defense Expenditure as % of GDP)

VARIABLES	(1) OLS	(2) Random Effects	(3) Fixed Effects
Military in Politics	0.240***	0.201***	0.202***
	(0.0376)	(0.0500)	(0.0550)
Previous War	1.061***	0.300	0.00702
	(0.309)	(0.279)	(0.280)
Population	-1.103***	-0.965***	-2.299***
	(0.0615)	(0.118)	(0.318)
GDP per capita	-0.192***	-0.425***	-0.529***
	(0.0456)	(0.0841)	(0.200)
Government Expenditure (% of GDP)	0.183***	0.282***	0.313***
	(0.00912)	(0.0130)	(0.0147)
Size of Military Personnel	1.187***	0.986***	0.631***
	(0.0574)	(0.0972)	(0.129)
Democracy	-0.977***	-0.465***	0.00926
	(0.110)	(0.158)	(0.185)
Constant	6.485***	6.502***	32.46***
	(0.793)	(1.625)	(4.561)
Observations	2,826	2,826	2,826
R-squared	0.309		0.199
Number of id		129	129
Country FE			YES
Hausman Test			P < 0.01***

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 2-10 Estimation result of Model 2

(Dependent Variable: The Defense Expenditure as % of Government Expenditure)

VARIABLES	(1) OLS	(2) Random Effects	(3) Fixed Effects
Military in Politics	0.439***	0.537***	0.599***
	(0.0814)	(0.0751)	(0.0735)
Previous War	3.983***	0.750**	0.270
	(0.693)	(0.359)	(0.343)
Population	-2.776***	-2.780***	-6.410***
	(0.126)	(0.233)	(0.406)
GDP per capita	-0.658***	-1.538***	-1.457***
	(0.0954)	(0.176)	(0.258)
Government Expenditure as share of GDP	0.0400*	0.0999***	0.0745***
	(0.0213)	(0.0201)	(0.0197)
Size of Military Personnel	3.153***	1.305***	0.664***
	(0.118)	(0.138)	(0.143)
Democracy	-5.343***	-0.538**	0.343
	(0.235)	(0.246)	(0.245)
Constant	26.80***	49.50***	115.6***
	(1.670)	(3.633)	(5.893)
Observations	2,413	2,413	2,413
R-squared	0.452		0.214
Number of id		129	129
Country FE			YES
Hausman Test			P < 0.01***

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 2-11 Estimation result of Model 3

(Dependent Variable: Military Service System; 1 = Conscription)

VARIABLES	(1) OLS	(2) Random Effects	(3) Fixed Effects
Military in Politics	0.0250***	0.0226***	0.0253***
	(0.00647)	(0.00538)	(0.00540)
Previous War	-0.271***	0.0807***	0.0750***
	(0.0546)	(0.0278)	(0.0276)
GDP per capita	-0.0591***	-0.0635***	-0.0977***
	(0.00831)	(0.0145)	(0.0197)
Population	0.485***	-0.612***	-0.726***
	(0.0586)	(0.0616)	(0.0720)
Population between 15-29	-0.664***	0.480***	0.566***
	(0.0596)	(0.0574)	(0.0600)
Size of Military Personnel	0.223***	0.117***	0.0949***
	(0.0101)	(0.0108)	(0.0114)
Democracy	0.0685***	-0.00213	-0.00389
	(0.0199)	(0.0169)	(0.0173)
Constant	0.0309	2.866***	4.010***
	(0.163)	(0.307)	(0.448)
Observations	3,147	3,147	3,147
R-squared	0.175		0.105
Number of id		132	132
Country FE			YES
Hausman Test			P < 0.01***

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

C. Sensitivity Analysis

In most countries, the budgeting process for this year is normally started and completed in previous year. Therefore, the estimation model should be structured to reflect the characteristic of the budgeting process. Here, I expand the analysis by using next year's expenditure as dependent variable in order to reflect the budgeting characteristic and mitigate possibility of reverse causality. Table 2-12 presents the result of sensitivity analysis which the ratio of defense expenditure_{T+1} to GDP is used as the dependent variable.

First, in pooled OSL model (1), the military in politics has a positive sign (0.188) and is statistically significant at the 1%. The point estimate suggests that 1-point increase in the military in politics level is associated with an increase in the defense expenditure as a share of GDP of 0.188%. The threat factor, previous war, has a positive (1.062) and is statistically significant at the 1%. The socio-economic factors, population and GDP per capita, are negatively associated with the defense expenditure at the 1% significant level. The size of military personnel and the government expenditure have positive signs and are statistically significant at the 1%. Lastly, the result shows that democracy has a negative sign (-1.177) and statistically significant relation with the defense expenditure.

Second, in random effect model (2), the military in politics has a positive sign (0.127) and is statistically significant at the 5%. The point estimate suggests that 1-point increase in the military in politics level is associated with an increase in the defense expenditure as a share of GDP of 0.127%. The threat factor, previous war, is not statistically significant. The socio-economic factors, population and GDP per capita, are negatively associated with the defense expenditure at the 1% significant level. The size of military personnel and the government expenditure have positive

signs and are statistically significant at the 1%. Lastly, the result shows that democracy has a negative sign (-1.006) and statistically significant relation with the defense expenditure.

Third, in fixed effect model (3), the military in politics has a positive sign (0.132) and is statistically significant at the 5%. The point estimate suggests that 1-point increase in the military in politics level is associated with an increase in the defense expenditure as a share of GDP of 0.132%. The threat factor, previous war, has found to be insignificant with a positive sign. The socio-economic factors, population and GDP per capita, are negatively associated. The size of military personnel and the government expenditure have positive signs and are statistically significant at the 1%. Lastly, the result shows that democracy has a negative sign (-0.721) and statistically significant relation with the defense expenditure at 1% significant level.

In summary, the results are consistent with the results obtained from Model 1 and Model 2 which suggests that a higher level of the military in politics is associated with an increase in the defense expenditure.

Table 2-12 Result of Sensitivity Analysis

(Dependent Variable: Defense Expenditure as % of Government Expenditure$_{t+1}$)

VARIABLES	(1) OLS	(2) Random Effects	(3) Fixed Effects
Military in Politics	0.188***	0.127**	0.132**
	(0.0373)	(0.0505)	(0.0566)
Previous War	1.062***	0.361	0.121
	(0.307)	(0.285)	(0.289)
Population	-1.098***	-1.040***	-2.250***
	(0.0612)	(0.116)	(0.330)
GDP per capita	-0.153***	-0.285***	-0.241
	(0.0454)	(0.0835)	(0.207)
Government Expenditure as a share of GDP	0.142***	0.179***	0.190***
	(0.00908)	(0.0131)	(0.0151)
Size of Military Personnel	1.173***	1.071***	0.881***
	(0.0572)	(0.0972)	(0.131)
Democracy	-1.177***	-1.006***	-0.721***
	(0.109)	(0.159)	(0.190)
Constant	7.059***	7.708***	29.00***
	(0.790)	(1.602)	(4.733)
Observations	2,829	2,829	2,829
R-squared	0.285		0.113
Number of id		129	129
Country FE		YES	
Hausman Test			P < 0.01***

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

D. Further Robustness Check

I conduct the two-step system GMM for robustness check. Table 2-13 the estimation result of Model 4 in which the ratio of defense expenditure to GDP is used as the dependent variable. The military in politics has a positive sign (0.515) and is statistically significant at the 1%. The result of Hansen's J test of over-identifying restriction, which tests the overall validity of the instruments, shows that it cannot reject the null hypothesis that the full set of orthogonality conditions are valid (p-value=1.000). The Arellano-Bond (2) test, which tests autocorrelations, shows that model has no second-order serial correlation in the first-differenced error term (p-value=0.294).

Table 2-13 presents the estimation result of Model 5 in which the ratio of defense expenditure to government expenditure is used as the dependent variable. The military in politics has a positive sign (0.720) and is statistically significant at the 1%. The result of Hansen's J test of over-identifying restriction shows that it cannot reject the null hypothesis that the full set of orthogonality conditions are valid (p-value=0.992). The Arellano-Bond (2) test shows that model has no second-order serial correlation in the first-differenced error term (p-value=0.992).

In summary, the estimation results suggest that a higher level of the military in politics is associated with an increase in the defense expenditure, and it confirms the results obtained from Model 1 and Model 2.

Table 2-13 Estimation result of Model 4
(Dependent Variable: The Defense Expenditure as % of GDP)

VARIABLES	(1) SGMM
L. Defense Expenditure	0.0391
	(0.0512)
Military in Politics	0.515***
	(0.181)
Previous War	-0.151
	(0.168)
Population	-1.152***
	(0.368)
GDP per capita	-0.531**
	(0.245)
Government Expenditure as a share of GDP	0.212***
	(0.0363)
Size of Military Personnel	0.865***
	(0.243)
Democracy	-1.064*
	(0.572)
Constant	12.70***
	(4.723)
Arellano-Bond AR(1) Test *(p-value)*	0.045
Arellano-Bond AR(2) Test *(p-value)*	0.294
Hansen J-statistics *(p-value)*	1
Observations	2,777
Number of id	129

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 2-14 Estimation result of Model 5
(Dependent Variable: The Defense Expenditure as % of Government Expenditure)

VARIABLES	(1) SGMM
L. Defense Expenditure	0.697***
	(0.0702)
Military in Politics	0.720**
	(0.348)
Previous War	-0.00988
	(0.337)
Population	-1.488**
	(0.747)
GDP per capita	-0.108
	(0.344)
Government Expenditure as a share of GDP	0.0547
	(0.0573)
Size of Military Personnel	1.088**
	(0.448)
Democracy	-1.345*
	(0.734)
Constant	14.44
	(9.592)
Arellano-Bond AR(1) Test (p-value)	0.000
Arellano-Bond AR(2) Test (p-value)	0.992
Hansen J-statistics (p-value)	0.992
Observations	2,319
Number of id	129

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

2.6. Conclusion

There have been continuous efforts by scholars to understand the nature of defense policy and find its determinants (Albalate et al., 2012; Batchelor et al., 2002; Chambers, 1975; Collier & Hoeffler, 2006; Dudley & Montmarquette, 1981; J. P. Dunne et al., 2008; P. Dunne & Perlo-Freeman, 2003; Fisher, 1969; Lau et al., 2004; Maizels & Nissanke, 1986; Nikolaidou, 2008; Poutvaara & Wagener, 2007; Smith, 1980; Trybula, 1999; Yildirim & Sezgin, 2005).

I argue that the military in politics is the most significant institutional and political determinant of defense policy. I establish the link between the military in politics and defense policy: how the military in politics would affect the defense policy. There are four reasons for the military to intervene in politics and policy process (N. Ball, 1981). As the military involvement in politics increase, there would be changes in civilian control of the military, an increase of risk of war, and more officers holding top bureaucratic positions. As a result, the defense policy favorable to the position of the military is more likely to be pursued and implemented.

I also construct the panel dataset of 129 countries using various data sources for the empirical test in order to support the argument with the empirical evidence. The defense expenditure and military service system are selected as proxy measures for defense policy because they are the most important and controversial aspects in the defense sector. The results indicate that there is a statistically significant relationship between the military in politics and defense policy. First, the military involvement in politics increases the defense expenditure as a percentage of GDP. The 1-point increase in the level of the military in politics increases about 0.20% the defense

expenditure as a share of GDP. Second, the military involvement in politics increases the defense expenditure as a percentage of government expenditure. The 1-point increase in the level of the military in politics increases about 0.60% of the defense expenditure as a share of government expenditure. Third, the military involvement in politics decreases the likeliness to switchover to the all-volunteer system from the conscription. These results are consistent in the pooled-OLS model, random effect model, and fixed effect model. The relationship between the military in politics and defense expenditure is further supported and strengthened by the robustness check using two-step system GMM.

The contribution of this study is that it considers the military in politics which has not been examined in past as the institutional and political determinant of defense policy. The previous literature has examined the institutional and political factors derived from democracy such as an electoral system, parliamentary system, and autocracy as policy determinants, but this study clearly shows that the military in politics is a key determinant of defense policy that must be considered. Notably, the democracy factor is not even statistically significant in the fixed effect model. Furthermore, it establishes the theoretical link between the military in politics and defense policy and supports with the empirical evidence.

Chapter 3. The military in politics and Social Policy

3.1. Introduction

The studying the determinant of social policy, particularly basic education and primary health, is particularly important as Sen (1998) has stated, "since premature mortality, significant undernourishment, and widespread illiteracy are deprivations that directly impoverish human life, the allocation of economic resources as well as arrangements for social provision must give some priority to removing these disadvantages for the affected population." The provision of basic education and primary health care is usually administered and managed by the government, and the education and health expenditure can be an indicator of the level of welfare of the country.

The education and health expenditure improve the national economy and the citizen's quality of life, and they are used as proxy measures for redistribution policy (Dodlova & Giolbas, 2015). Increasing the education expenditure has a positive effect on access to and attainment in schools (Gupta, Verhoeven, & Tiongson, 2002). Hanushek and Wößmann (2007) have found that the education has a positive effect on the economic growth of the country, and it also leads to the improvement of human capital, which also affects the increase in labor productivity and the income of individuals. In addition, increasing the health expenditure reduces mortality rates for infants and children (Gupta et al., 2002). Many studies have found that the health expenditure is significantly and positively associated with health status and has a beneficial impact on the overall health condition of the population (Bidani &

Ravallion, 1997; Filmer & Pritchett, 1997; Hojman, 1996; K. Kim & Moody, 1992)

Therefore, it is worth asking whether there are any particular institutional characteristics that might promote or impede the social expenditure. Are there any institutional factors that might promote or impede the provision of basic education and primary health care? If so, what are these factors? These questions are best understood if the determinants of social expenditure are examined. In this chapter, I consider new political and institutional factor, the military in politics, to find the determinant of education and health expenditure. This is the first attempt to examine the social expenditure with the concept of the military in politics. This would enhance the understanding of military institutions.

The paper is organized as follows: the next section provides a discussion of a theoretical model and a review of the relevant literature. Section III describes empirical strategy including panel data set and methodology. Section IV presents the empirical findings. Finally, section V concludes.

3.2. Literature Review

A. The defense expenditure and National well-being

The conventional and widespread views on the relationship between the defense expenditure and social expenditure can be represented with the gun or butter model. It refers to the relationship between a nation's investment in defense and civilian goods: increase in military spending may distort the resource allocation and redistribution policy and reduces the efficiency of resource allocation and public and social spending, and vice versa. In the United States in the 1980s, the President

Reagan's long-term plan to increase defense expenditure by over 80% was proposed and supported by the public, and as a result, many social expenditures including cash transfer for the poor greatly suffered from it (Domke, Eichenberg, & Kelleher, 1983). Russett (1982) argued that "if a nation increases the resourced devoted to military activities without increasing total product, civilian sectors of the economy must pay by foregoing benefits they would otherwise receive." He tested the relationship between the military spending and expenditures for health and education in the United States, covering the period from 1941 to 1979 and controlling important political, economic and demographic factors, and found the systematic trade-offs between the military spending and expenditures for health and education (Russett, 1982).

The trade-offs between the defense expenditure and social expenditure are further supported by many empirical studies (Apostolakis, 1992; Dabelko & McCormick, 1977; Domke et al., 1983; Scheetz, 1992; Zhao, Zhao, & Chen, 2015). Dabelko and McCormick (1977) examined the relationship between the defense expenditure and education and health expenditure for the period from 1950 to 1972 and found the significant and negative relationship in all countries and all years. Domke et al. (1983) investigated the trade-offs between defense expenditure and welfare expenditure for four major NATO allies including the United States, United Kingdom, Germany, and France for the period from 1948 to 1978, and found the significant evidence that trade-offs occurred. Further studies by Apostolakis (1992) confirmed trade-offs between the defense expenditure and education and health expenditure in a study of 19 Latin American countries for the period from 1953 to 1987. Scheetz (1992) examined the central government expenditures for four Latin American countries for period from 1969 to 1987 and found that (1) the defense

expenditure is the largest functional outlay; (2) the defense expenditure crowds out social expenditures; and (3) military regimes spend less on social areas than do civilian regimes.

In conclusion, there are systematic trade-offs between the defense expenditure and social expenditures for education and health, and the existence of a trade-off between defense expenditures and social spending is widely hypothesized and supported as discussed above.

B. Democracy and social protection

The voting theory implies that democracy improves social protection. Three principles of the voting theory are as follow. First, voting process mitigates the expression of strong policy preferences, for example, parents forcing their kids to participate for their favor. Second, it has a distribution of political power as democracy would massively redistribute from rich to poor. It is found that democratic regimes generally choose policies that are more favorable to the poor than non-democrats. And, tax policy is mainly affected (Alesina & Rodrik, 1994; Tabellini, 1992; Olso 1993) Third, it is the form of the voting game; different political institutions would result in different policies. In democratic countries, citizens can express and support their policy preferences through voting, and as a result, social welfare policies are more developed and widely adopted than non-democratic countries.

A substantial and growing literature addresses the relationship between democracy and social protection. Many studies show that democratic countries do a better job than non-democrats of improving and providing social benefit to its citizens (Baum & Lake, 2003; Brown & Hunter, 1999; Ross, 2006; Stasavage, 2005).

Brown and Hunter (1999) empirically investigated the impact of democracy on social spending, controlling for GDP, debts, inflation, and age structure of the population, for 17 Latin American countries from 1980 to 1992. They found that democracies increase the allocation of resources to social programs relative to authoritarian regimes. Baum and Lake (2003) conducted empirical analysis using a 30-year panel of 128 countries and found that democracy is an important determinant of the public health and education. Stasavage (2005) investigated the relationship between democracy and education focusing on African countries and revealed that democratically elected governments have spent more expenditure on education.

3.3. Theoretical Framework

There is a positive relationship between the Military in Politics and defense expenditure based on the theory of military as discussed in chapter two. Figure 3-1 illustrates how military involvement in politics could affect the policy and explains military in politics as a determinant for redistribution policy.

I argue that the military in politics will have an impact on the social expenditure through changes in the composition of government expenditure. As military involvement in politics increases, the defense expenditure also increases. This will lead to a reduction in social expenditure, and vice versa.

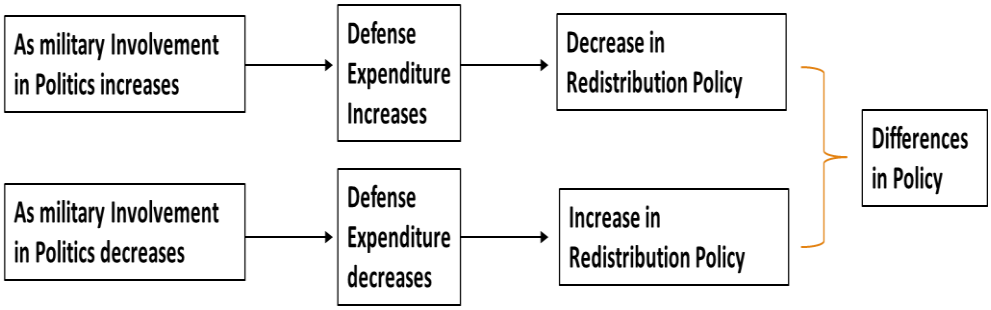

Figure 3-1 How military involvement in politics affect the policy

There are two analysis models and their dependent variables are the education expenditure and health expenditure. They are based on the standard models of the determinants of social expenditure (C. B. Mulligan et al., 2004) which include demographic and socioeconomic variables. In addition, the GDP per capita, which measures the country's level of economic development, is added considering Wagner's Law, which states that public sector grows as a nation becomes richer (Hessami, 2014). I also add the ratio of government expenditure to GDP, which is routinely used as a control variable in the government expenditure equation (Gupta et al., 2001).

Model 1: The Education Expenditure (% of GDP)

$$\text{Education Expenditure}_{i,t} = \alpha_0 + \beta_1(\text{Mil\_Pol})_{i,t} + \beta_2(\text{DE})_{i,t} + \beta_3(\text{LnGDPP})_{i,t} + \beta_4(\text{LnPOP})_{i,t} + \beta_5(\text{POP65+})_{i,t} + \beta_6(\text{Govt\_Exp\_GDP})_{i,t} + \beta_7(\text{Demo})_{i,t} + \delta_i + \varepsilon_{i,t}$$

$Mil\_Pol_{i,t}$= Military in Politics

$DE_{i,t}$= Defense Expenditure

$LnGDPP_{i,t}$= ln(GDP per capita)

$LnPOP_{i,t}$= ln(Population)

$POP65+_{i,t}$= Population age over 65

$Govt\_Exp\_GDP_{i,t}$= Government expenditure as a percentage of GDP

$Demo_{i,t}$= Democracy

δ_i = Individual-specific variable

$\varepsilon_{i,t}$ = Error term

Model 2: The Health Expenditure (% of GDP)

$$\text{Health Expenditure}_{i,t} = \alpha_0 + \beta_1(\text{Mil\_Pol})_{i,t} + \beta_2(\text{DE})_{i,t} + \beta_3(\text{LnGDPP})_{i,t} + \beta_4(\text{LnPOP})_{i,t} + \beta_5(\text{POP65+})_{i,t} + \beta_6(\text{Govt\_Exp\_GDP})_{i,t} + \beta_7(\text{Demo})_{i,t} + \delta_i + \varepsilon_{i,t}$$

$Mil\_Pol_{i,t}$= Military in Politics

$DE_{i,t}$= Defense Expenditure

$LnGDPP_{i,t}$= ln(GDP per capita)

$LnPOP_{i,t}$= ln(Population)

$POP65+_{i,t}$== Population age over 65+

$Govt\_Exp\_GDP_{i,t}$= Government expenditure as a percentage of GDP

$Demo_{i,t}$= Democracy

δ_i = Individual-specific variable

$\varepsilon_{i,t}$ = Error term

In addition, the policy-making process different for each country, and the difference can be distinguished according to whether the process is due to a

democratic process. As I have discussed in the previous section, many types of research have proved empirically that the level of social protection is varied as well as the share of government expenditure allocated to social protection depending on the democracy (Baum & Lake, 2003; Brown & Hunter, 1999; Ross, 2006; Stasavage, 2005). The reason for this difference can be attributed to participants participating in the policy process. In the case of a democracy, there may be several individuals or groups whose interests are in conflict with each other, and each employs a variety of methods and means to try to persuade policymakers to pursue their interests. Accordingly, various opinions are considered and reflected in the policy process. But in autocratic countries, participation in this policy process is limited. Only dictators or elite groups, which are the upper power of the state, can participate in the policy-making process and make policy decisions. In this context, a military fall in elite group and is involved in the decision-making process. According to Kimenyi and Mbaku (1996), "in autocratic regimes, the military is in a position to extract rents, because without the support of the military the government is in general not able to sustain itself," and they support its claim with empirical evidence.

Therefore, I construct following typology, as depicted in Figure 3-2, for analysis framework based on the voting theory and theory of military in politics.

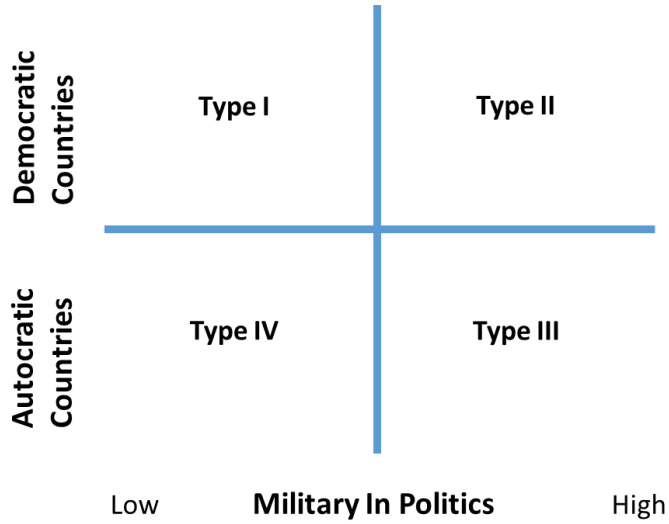

Figure 3-2 Typology for Analysis Framework

Type I includes democratic countries with a low military in politics, Type II includes democratic countries with a high military in politics, Type III includes democratic countries with a high military in politics, and Type IV includes democratic countries with a low military in politics. I argue that there will be differences in government expenditures for education and health depending on the type. There are two analysis models (Model 3 and Model 4) considering interaction effect between the military in politics and democracy. They are based on the Model 1 and Model 2 which include demographic and socioeconomic variables. In addition, the GDP per capita, which measures the country's level of economic development, is added considering Wagner's Law, which states that public sector grows as a nation becomes richer (Hessami, 2014). I also add the ratio of government expenditure to GDP, which is routinely used as a control variable in the government expenditure equation (Gupta et al., 2001).

Model 3: The Education Expenditure (% of GDP)

$$\text{Education Expenditure}_{i,t} = \alpha_0 + \beta_1(\text{Mil}_{\text{Pol}})_{i,t} + \beta_2(\text{DE})_{i,t} + \beta_3(\text{LnGDPP})_{i,t} + \beta_4(\text{LnPOP})_{i,t} + \beta_5(\text{POP65 +})_{i,t} + \beta_6(\text{Govt\_Exp\_GDP})_{i,t} + \beta_7(\text{Demo})_{i,t} + \beta_8(\text{Interaction})_{i,t} + \delta_i + \varepsilon_{i,t}$$

$Mil\_Pol_{i,t}$= Military in Politics

$DE_{i,t}$= Defense Expenditure

$LnGDPP_{i,t}$= ln(GDP per capita)

$LnPOP_{i,t}$= ln(Population)

$POP65+_{i,t}$== Population age over 65+

$Govt\_Exp\_GDP_{i,t}$= Government expenditure as a percentage of GDP

$Demo_{i,t}$= Democracy

$Interaction_{i,t}$= Military in Politics * Democracy

δ_i = Individual-specific variable

$\varepsilon_{i,t}$ = Error term

Model 4: The Health Expenditure (% of GDP)

$$\text{Health Expenditure}_{i,t} = \alpha_0 + \beta_1(\text{Mil}_{\text{Pol}})_{i,t} + \beta_2(\text{DE})_{i,t} + \beta_3(\text{LnGDPP})_{i,t} + \beta_4(\text{LnPOP})_{i,t} + \beta_5(\text{POP65 +})_{i,t} + \beta_6(\text{Govt\_Exp\_GDP})_{i,t} + \beta_7(\text{Demo})_{i,t} + \beta_8(\text{Interaction})_{i,t} + \delta_i + \varepsilon_{i,t}$$

$Mil\_Pol_{i,t}$= Military in Politics

$DE_{i,t}$= Defense Expenditure

$LnGDPP_{i,t}$= ln(GDP per capita)

$LnPOP_{i,t}$= ln(Population)

$POP65+_{i,t}$== Population age over 65+

$Govt\_Exp\_GDP_{i,t}$= Government expenditure as a percentage of GDP

$Demo_{i,t}$= Democracy

$Interaction_{i,t}$= Military in Politics * Democracy

δ_i = Individual-specific variable

$\varepsilon_{i,t}$ = Error term

3.4. Empirical Strategy: Data, Variables and Robustness Check

A. Data and Variables

I have constructed a balanced panel data set covering 129 countries for the period from 1984 to 2013. The countries considered are those for which both the military in politics information and military expenditure information exists in the ICRG and SIPRI database. The data for this chapter come from various sources as organized in Table 3-1

First, the independent variable, the military in politics, measures the involvement of the military in politics and is from the International Country Risk Guide (ICRG)[6] which is very commonly used in academia since its first publication in 1984. Howell (2011) states that "s*ince the military is not elected, involvement, even at a peripheral level, diminishes democratic accountability. Military involvement might stem from*

[6] The developer of PRS data, Howell (1998), stated that "most data in country and political risk is what we call expert data" and argued "expert data is systematically derived from country specialists with high levels of training and decades of experience."

an external or internal threat, be symptomatic of underlying difficulties, or be a full-scale military takeover. Over the long term, a system of military government will almost certainly diminish effective governmental functioning."

The military in politics variable uses 7 points scales, with the highest number of point (6) indicating the highest military involvement in politics and the lowest number (0) indicating the lowest military involvement in politic. ICRG data is very commonly used in academia since its academia since its first publication in 1984. The developer of PRS data, Howell (1998), stated that "most data in country and political risk is what we call expert data (and not, as is often asserted, just opinion)" and argued "expert data is systematically derived from country specialists with high levels of training and decades of experience."

The dependent variables are the education expenditure and health expenditure from the world development indication (WDI) provided by the World Bank. The control variables are the defense expenditure as a percentage of GDP, gross domestic product (GDP) per capita, population, population age over 65, government expenditure, democracy. The defense expenditure data come from the Stockholm International Peace Research Institute (SIPRI). SIPRI has produced very reliable defense sector data since 1949 and it contains consistent time series on the defense expenditure. The data for GDP per capita, population, population age over 65, and government expenditure are from the world development indication (WDI) provided the World Bank. The natural log value is taken for the GDP per capita, population, and the government expenditure is measured as a percentage of the GDP. Lastly, variables for democracy and previous war are from the polity VI project. I have constructed dummy variables based on the polity VI data: the democracy variable takes the value of 1 if the democratic country and 0 if the authoritarian country.

Table 3-1 List of variables and its measurement

Variables		Measurement	Definition	Source
Independent Variable	Military in Politics	Low - High (0 – 6)	Involvement of the military in politics	International Country Risk Guide (ICRG)
Dependent Variable	Education Expenditure	% of GDP	Data for Education expenditure as a percentage of GDP	World Development Indicator (WDI)
	Health Expenditure	% of GDP	Data for Health expenditure as a percentage of GDP	
Control Variable	Defense Expenditure	% of GDP	Data for Defense Expenditure as a percentage of GDP	SIPRI
	GDP per Capita	Ln GDP per capita	Measured as GDP per capita (US $ 2010 constant)	World Development Indicator (WDI)
	Population	Ln Population	Total Population	
	Population 65+	% of Population	% of population aged 65 +	
	Government Expenditure	% of GDP	Government Expenditure as a percentage of GDP	
	Democracy	Dummy variable	A dummy variable taking the value of 1 if the democratic country and 0 if the authoritarian country	Polity IV

B. The Dynamic Panel estimation for Robustness Check

The dynamic panel estimation is conducted for further robustness check. The estimators from the dynamic panel estimation are more consistent for panel data with small time periods, 'small T,' and many individual units, 'large N.' The dynamic panel estimation includes lagged levels of the dependent variable as regressors, and it can be represented as follow:

$$Y_{it} = \alpha + Y_{it-1} + \beta x_{it} + \delta_i + \epsilon_{it}$$

Here, Y is a dependent variable observed for individual i at time t, α is a constant, β is a regression coefficient, x is an independent variable, δ is an individual-specific and time-invariant effect which are fixed over time, ϵ is an error term.

However, in dynamic panel estimation, both the fixed effect and random effect cannot be used. Nickell (1981) has shown that the fixed effect creates a bias in the estimate of the coefficient of the lagged dependent variable. Within transformation process which subtracts the individual's mean value of y and each x from the respective variable inevitably creates a correlation between the explanatory variable and error term. The mean of the lagged dependent variable contains observations 0 through (T − 1) on y, and the mean error, which is being conceptually subtracted from each ϵ_{it}, contains contemporaneous values of ϵ for t = 1 . . . T. Moreover, in the random effect estimation, the lagged dependent variable contains δ_i, an individual-specific and time-invariant effect which is fixed over time. Consequently, $\mathrm{Cov}(Y_{it-1}, \delta_i) \neq 0$ because both error term and the explanatory variable contain δ_i, and it does not satisfy the basic assumption of the random effect estimation,

Cov(x_{it}, δ_i)= 0. The random effect cannot be used in dynamic panel estimation.

In the dynamic panel estimation, where the lagged dependent variable is included, generalized method moments (GMM) should be used for analysis. Arellano and Bond (1991) have first developed difference GMM method for the dynamic panel analysis and Windmeijer (2005) later has developed system GMM which is widely used in recent works. In the system GMM, the consistency of estimator depends on the validity of the instruments. Thus, following two specification tests are preferred. The first is a Hansen J-test of over-identifying restrictions, which tests the overall validity of the instruments and the second is the Arellano-Bond test for autocorrelation (Woo & Kumar, 2015). Moreover, the two-step system GMM requires to use the robust error (Windmeijer, 2005), otherwise, the estimator is not a consistent estimator and biased.

The two-step system GMM is used for the dynamic panel analysis and robustness check. As discussed in chapter 2, both Hansen J-test of over-identifying restrictions and Arellano-Bond test will be conducted and the robust error will be used for the analysis. The model 5, model 6, model 7, and model 8 represent the estimation equation used for the dynamic panel analysis.

Model 5: The Education Expenditure (% of GDP)

$$\text{Education Expenditure}_{i,t} = \alpha_0 + \beta_1(EDU)_{i,t-1} + \beta_2(\text{Mil\_Pol})_{i,t} + \beta_3(\text{DE})_{i,t} + \beta_4(\text{LnGDPP})_{i,t} + \beta_5(\text{LnPOP})_{i,t} + \beta_6(\text{POP65}+)_{i,t} + \beta_7(\text{Govt\_Exp\_GDP})_{i,t} + \beta_8(\text{Demo})_{i,t} + \delta_i + \varepsilon_{i,t}$$

$EDU_{i,t-1}$= The lagged education expenditure

$Mil\_Pol_{i,t}$= Military in Politics

$DE_{i,t}$= Defense Expenditure

$LnGDPP_{i,t}$= ln(GDP per capita)

$LnPOP_{i,t}$= ln(Population)

$POP65+_{i,t}$== Population age over 65+

$Govt\_Exp\_GDP_{i,t}$= Government expenditure as a percentage of GDP

$Demo_{i,t}$= Democracy

δ_i = Individual-specific variable

$\varepsilon_{i,t}$ = Error term

Model 6: The Health Expenditure (% of GDP)

$$\text{Health Expenditure}_{i,t} = \alpha_0 + \beta_1(HEALTH)_{i,t-1} + \beta_2(\text{Mil\_Pol})_{i,t} + \beta_3(\text{DE})_{i,t} + \beta_4(\text{LnGDPP})_{i,t} + \beta_5(\text{LnPOP})_{i,t} + \beta_6(\text{POP65}+)_{i,t} + \beta_7(\text{Govt\_Exp\_GDP})_{i,t} + \beta_8(\text{Demo})_{i,t} + \delta_i + \varepsilon_{i,t}$$

$HEALTH_{i,t-1}$= The lagged health expenditure

$Mil\_Pol_{i,t}$= Military in Politics

$DE_{i,t}$= Defense Expenditure

$LnGDPP_{i,t}$= ln(GDP per capita)

$LnPOP_{i,t}$= ln(Population)

$POP65+_{i,t}$== Population age over 65+

$Govt\_Exp\_GDP_{i,t}$= Government expenditure as a percentage of GDP

$Demo_{i,t}$= Democracy

δ_i = Individual-specific variable

$\varepsilon_{i,t}$ = Error term

Model 7: The Education Expenditure (% of GDP)

$$\text{Education Expenditure}_{i,t} = \alpha_0 + \beta_1(EDU)_{i,t-1} + \beta_2(\text{Mil\_Pol})_{i,t} + \beta_3(\text{DE})_{i,t} + \beta_4(\text{LnGDPP})_{i,t} + \beta_5(\text{LnPOP})_{i,t} + \beta_6(\text{POP65 +})_{i,t} + \beta_7(\text{Govt\_Exp\_GDP})_{i,t} + \beta_8(\text{Demo})_{i,t} + \beta_9(\text{Interaction})_{i,t} + \delta_i + \varepsilon_{i,t}$$

$EDU_{i,t-1}$= The lagged education expenditure

$Mil\_Pol_{i,t}$= Military in Politics

$DE_{i,t}$= Defense Expenditure

$LnGDPP_{i,t}$= ln(GDP per capita)

$LnPOP_{i,t}$= ln(Population)

$POP65 +_{i,t}$== Population age over 65+

$Govt\_Exp\_GDP_{i,t}$= Government expenditure as a percentage of GDP

$Demo_{i,t}$= Democracy

$Interaction_{i,t}$= Military in Politics * Democracy

δ_i = Individual-specific variable

$\varepsilon_{i,t}$ = Error term

Model 8: The Health Expenditure (% of GDP)

$$\text{Health Expenditure}_{i,t} = \alpha_0 + \beta_1(HEALTH)_{i,t-1} + \beta_2(\text{Mil\_Pol})_{i,t} + \beta_3(\text{DE})_{i,t} + \beta_4(\text{LnGDPP})_{i,t} + \beta_5(\text{LnPOP})_{i,t} + \beta_6(\text{POP65 +})_{i,t} + \beta_7(\text{Govt\_Exp\_GDP})_{i,t} + \beta_8(\text{Demo})_{i,t} + \beta_9(\text{Interaction})_{i,t} + \delta_i + \varepsilon_{i,t}$$

$HEALTH_{i,t-1}$= The lagged health expenditure

$Mil\_Pol_{i,t}$= Military in Politics

$DE_{i,t}$= Defense Expenditure

$LnGDPP_{i,t}$= ln(GDP per capita)

$LnPOP_{i,t}$= ln(Population)

$POP65+_{i,t}$== Population age over 65+

$Govt\_Exp\_GDP_{i,t}$= Government expenditure as a percentage of GDP

$Demo_{i,t}$= Democracy

$Interaction_{i,t}$= Military in Politics * Democracy

δ_i = Individual-specific variable

$\varepsilon_{i,t}$ = Error term

3.5. Empirical Results

A. Basic Analysis Result

Table 3-2 depicts the descriptive statistics for variables. Based on the empirical model, 129 countries are subject to analysis, but the analysis of up to 134 countries is shown in descriptive statistics. The mean, standard deviation, minimum, and maximum of variables are displayed, and upper case 'N' represents total observations,

low case ‘n’ represents a total number of country, and Year refers to the average observation periods. Of these values, the meaning of the standard deviation is important, and there are three different standard deviations in panel data. First one is a between standard deviation, which is the difference between the countries that are analyzed. The second one is a within the standard deviation, which is a variation that changes over time in one country. The third one is an overall standard deviation, which is a variation of all of the data points in the panel data.

Typically, a deviation between countries is larger than a deviation within a country, which means that there is a greater deviation of data across countries than data deviations within a country over time. Nonetheless, a deviation between countries for the defense expenditure is smaller than a deviation within a country. In addition, the ratio of the standard deviation within the country to the standard deviation between countries provides a better understanding the nature of the data. The population variable has the lowest ratio of the standard deviation within the country to the standard deviation between countries. The GDP per capita variable has the highest ratio of the standard deviation.

The health and education expenditure variables have the between countries standard deviation of 2.21 and 1.69 and the within-country standard deviation of 0.96 and the ratio of 1.16 respectively. The military in politics variable has the between countries standard deviation of 1.61 and the within-country standard deviation of 0.80 and the ratio of 0.49. For the defense expenditure variable, the between countries standard deviation is 2.24 and the within-country standard deviation is 2.99 and the ratio is 1.33. The population variable has the between countries standard deviation of 1.50 and the within-country standard deviation of 0.17 and the ratio of 0.11. The population age over 65 variable has the between countries standard

deviation of 0.048 and the within-country standard deviation of 0.011 and the ratio of 0.23. The GDP per capita variable has the between countries standard deviation of 1.53 and the within-country standard deviation of 0.24 and the ratio of 0.15. The government expenditure variable has the between countries standard deviation of 5.16 and the within-country standard deviation of 3.47 and the ratio of 0.67. The democracy variable has the between countries standard deviation of 0.39 and the within-country standard deviation of 0.27 and the ratio of 0.69.

Table 3-3 shows the correlation analysis result. The correlation between the dependent variables and other variables is as follows. First, the dependent variable, the health expenditure as a percentage of GDP, has a negative correlation with the independent variable, the military in politics, and its correlation coefficient is -0.393. The health expenditure has a positive correlation with the control variables, population over 65, GDP per capita government expenditure, and democracy, and their correlation coefficients are 0.578, 0.460, 0.434, and 0.368 respectively. On the other hand, it has a negative correlation with defense expenditure and population, and their correlation coefficients are -0.178 and -0.0365 respectively.

Second, the dependent variable, the education expenditure as a percentage of GDP, has a negative correlation with the independent variable, the military in politics, and its correlation coefficient is -0.408. The education expenditure has a positive correlation with the control variables, defense expenditure, and population age over 65, GDP per capita, government expenditure, and democracy and their correlation coefficients are 0.00639, 0.319, 0.366, 0.673, and 0.121 respectively. On the other hand, it has a negative correlation with population, and its correlation coefficient is -0.156.

From the correlation analysis results, it is expected that the military in politics

would have a negative impact on the social expenditure as discussed in the previous section. It is clear that as a country gets richer and the government gets bigger, more resources are allocated to social expenditures, and democracy also plays a significant role in expanding social expenditure.

Table 3-2 Descriptive Statistics

Variable		Mean	S.D	Min	Max	Observations
Health Expenditure (% of GDP)	overall	6.19724	2.40605	1.44624	17.0571	N= 2511
	between		2.21079	1.9054	14.9271	n= 133
	within		0.96134	0.89478	11.8466	Year=18.8797
Education Expenditure (% of GDP)	overall	4.457216	1.9174	0	44.334	N= 2068
	between		1.6965	1.07399	13.4027	n= 129
	within		1.16168	-6.9721	35.3885	Year=16.031
Military in Politics	overall	2.33018	1.81821	0	6	N=3760
	between		1.61636	0	5.686	n=134
	within		0.80236	-0.3991	6.36918	Year=28.0597
Defense Expenditure (% of GDP)	overall	2.68518	3.76922	0	117.388	N=3450
	between		2.24106	0	14.1404	n=133
	within		2.99136	-7.0453	107.336	Year=25.9398
Ln Population	overall	16.2453	1.50832	12.741	21.0288	N=4011
	between		1.50224	12.9737	20.9245	n=134
	within		0.17842	15.3523	17.4073	Year=29.9328
Population (Age 65 +)	overall	0.072973	0.049715	0.007505	0.246298	N= 4011
	between		0.048558	0.010231	0.176563	n= 134
	within		0.011529	0.0073	0.155143	Year=29.9328
Ln GDP per Capita	overall	8.38407	1.56251	4.75181	11.626	N=3732
	between		1.53495	5.4235	11.3008	n=132
	within		0.24502	7.16887	9.64426	Year=28.2727
Government Expenditure (% of GDP)	overall	15.9397	6.20683	0	76.2221	N=3634
	between		5.16409	4.78889	32.1678	n=133
	within		3.47778	-0.1629	66.163	Year=27.3233
Democracy	overall	0.64901	0.47734	0	1	N=4020
	between		0.39234	0	1	n=134
	within		0.27393	-0.3177	1.61567	T=30

Table 3-3 Correlation Analysis Result

	Military in Politics	Education Expenditure (% of Gov't)	Health Expenditure (% of Gov't)	Defense Expenditure (% of Gov't)	Population	Population (Over 65)	GDP per capita	Government Expenditure (% of GDP)	Democracy
Military in Politics	1								
Education Expenditure (% of GDP)	-0.408***	1							
Health Expenditure (% of Gov't)	-0.393***	0.393***	1						
Defense Expenditure (% of Gov't)	0.0995***	0.00639	-0.178***	1					
Population	0.145***	-0.156***	-0.0365	-0.00340	1				
Population 65+	-0.644***	0.319***	0.578***	-0.169***	-0.0514	1			
GDP per capita	-0.707***	0.366***	0.460***	0.111***	-0.114***	0.720***	1		
Government Expenditure (% of GDP)	-0.474***	0.673***	0.434***	0.235***	-0.171***	0.500***	0.500***	1	
Democracy	-0.289***	0.121***	0.368***	-0.340***	0.0397	0.391***	0.238***	0.109***	1

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

B. Estimation Results

(1) The military in politics and the education expenditure

Table 3-5 presents the result of the estimation of Model 1 in which the ratio of education expenditure to GDP is used as the dependent variable. First, in pooled OSL model (1), the military in politics has a negative sign (-0.179) and is statistically significant at the 1%. The point estimate suggests that 1-point increase in the military in politics level is associated with a decrease in the education expenditure as a share of GDP of 0.179%. The institutional factor, democracy, has a negative (-0.170) and is statistically significant at the 10%. The defense expenditure is negatively associated (-0.180) with the education expenditure at the 1% significant level. The GDP per capita and government expenditure have positive signs and are statistically significant at the 5% and 1% respectively, but population age over 65 has a negative sign (-7.016) and statistically significant relation with the education expenditure at 1% significant level.

Second, in random effect model (2), the military in politics has a negative sign (-0.289) and is statistically significant at the 1%. The point estimate suggests that 1-point increase in the military in politics level is associated with a decrease in the education expenditure as a share of GDP of 0.289%. The institutional factor, democracy, has a negative (-0.460) and is statistically significant at the 1%. The defense expenditure is negatively associated (-0.102) with the education expenditure at the 1% significant level. The GDP per capita and government expenditure have positive signs and are statistically significant at the 5% and 1% respectively. Lastly, the population is positively associated with the education expenditure at 1% significant level, but population age over 65 is not significantly related.

Third, in fixed effect model (3), the military in politics has a negative sign (-

0.344) and is statistically significant at the 1%. The point estimate suggests that 1-point increase in the military in politics level is associated with a decrease in the education expenditure as a share of GDP of 0.344%. The institutional factor, democracy, has a negative (-0.691) and is statistically significant at the 1%. The defense expenditure is not significantly related to the education expenditure. The GDP per capita and government expenditure have positive signs and are statistically significant at the 1%. Lastly, the population is positively associated with the education expenditure at 1% significant level, but population age over 65 is not significantly related.

Overall, the estimation results suggest that a higher level of the military in politics is associated with a decrease in the education expenditure. It implies that the military in politics is a significant determinant of education expenditure. This result is consistent across all models presented. The Hausman test results reject the null hypothesis at significant level 1%, suggesting that the fixed effect models are better suited to model the data. Table 3-4 shows the summary of fixed effect model result.

Table 3-4 Fixed Effect Model Result of Model 1

Variables	Relationship with the Defense Expenditure
Military in Politics	Positive***
Previous War	Positive, but not significant
Population	Negative***
GDP per Capita	Negative***
Government Expenditure % of GDP	Positive***
Size of the military	Positive***
Democracy	Positive, but not significant

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 3-5 Estimation result of Model 1

(Dependent Variable: Education Expenditure as % of GDP)

VARIABLES	(1) OLS	(2) Random Effects	(3) Fixed Effects
Military in Politics	-0.179***	-0.289***	-0.344***
	(0.0333)	(0.0385)	(0.0401)
Democracy	-0.170*	-0.460***	-0.691***
	(0.100)	(0.132)	(0.145)
Defense Expenditure	-0.180***	-0.102***	0.0306
	(0.0194)	(0.0284)	(0.0331)
GDP per capita	0.0889**	0.207**	0.538***
	(0.0416)	(0.0929)	(0.171)
Population	-0.00513	0.262***	1.690***
	(0.0256)	(0.0788)	(0.240)
Population (Age over 65+)	-7.016***	-2.806	-2.995
	(1.135)	(2.351)	(3.117)
Government Expenditure (% of GDP)	0.222***	0.176***	0.160***
	(0.00868)	(0.0129)	(0.0141)
Constant	1.713***	-3.062**	-29.30***
	(0.578)	(1.533)	(3.679)
Observations	1,895	1,895	1,895
R-squared	0.367		0.169
Number of id		123	123
Country FE			YES
Hausman Test			P < 0.01***

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

(2) The military in politics and health expenditure

Table 3-7 presents the results of the estimation of Model 2 in which the ratio of health expenditure to GDP is used as the dependent variable. First, in pooled OSL model (1), the military in politics has a negative sign (-0.179) but is not statistically significant at the 1%. The institutional factor, democracy, has a positive (0.970) and is statistically significant at the 1%. The defense expenditure is negatively associated (-0.161) with the health expenditure at the 1% significant level. The government expenditure has a positive sign (0.134) and is statistically significant at 1%. The population age over 65 has a positive sign (16.47) and statistically significant relation with the health expenditure at 1% significant level. The GDP per capita and the population are not statistically significant.

Second, in random effect model (2), the military in politics has a positive sign (0.0590) and is statistically significant at the 10%. The point estimate suggests that 1-point increase in the military in politics level is associated with an increase in the health expenditure as a share of GDP of 0.0590%. The institutional factor, democracy, has a positive (0.205) and is statistically significant at the 10%. The defense expenditure is not statistically related to the health expenditure. The socio-economic factors, GDP per capita and population, population age over 65 have positive signs and are statistically significant at the 1%. Lastly, the government expenditure is positively associated with the education expenditure at 1% significant level.

Third, in fixed effect model (3), the military in politics has a positive sign (0.00411) but is not statistically significant at the 1%. The institutional factor, democracy, is not statistically significant. The defense expenditure is positively associated (0.107) with the health expenditure at the 1% significant level. The socio-economic factors, GDP per capita and population, population age over 65 have

positive signs and are statistically significant at the 1%. Lastly, the government expenditure has a positive sign (0.112) and is statistically significant at 1%.

Overall, the estimation results are mixed: the military in politics is not significant with a negative sign in the pooled OLS model, the military in politics is positively significant at 10% significant level in random effect model, and the military in politics is not significant with a positive sign in the fixed effect model. Therefore, it is hard to conclude that the military in politics is a significant determinant of health expenditure. The Hausman test results reject the null hypothesis at significant level 1%, suggesting that the fixed effect models are better suited to model the data. Table 3-6 shows the summary of fixed effect model result.

Table 3-6 Fixed Effect Model Result of Model 2

Variables	Relationship with the Defense Expenditure
Military in Politics	Positive***
Previous War	Positive, but not significant
Population	Negative***
GDP per Capita	Negative***
Government Expenditure % of GDP	Positive***
Size of the military	Positive***
Democracy	Positive, but not significant

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 3-7 Estimation result of Model 2
(Dependent Variable: Health Expenditure as % of GDP)

VARIABLES	(1) OLS	(2) Random Effects	(3) Fixed Effects
Military in Politics	-0.00608	0.0590*	0.00411
	(0.0348)	(0.0351)	(0.0356)
Democracy	0.970***	0.205*	-0.0244
	(0.109)	(0.107)	(0.109)
Defense Expenditure	-0.161***	0.00125	0.107***
	(0.0278)	(0.0315)	(0.0327)
GDP per capita	-0.0341	0.340***	0.532***
	(0.0432)	(0.0938)	(0.132)
Population	-0.00454	0.539***	1.841***
	(0.0283)	(0.0913)	(0.189)
Population (Age over 65+)	16.47***	27.54***	32.22***
	(1.240)	(2.397)	(2.850)
Government Expenditure (% of GDP)	0.134***	0.117***	0.112***
	(0.00992)	(0.00955)	(0.00954)
Constant	2.906***	-9.727***	-33.12***
	(0.637)	(1.650)	(2.882)
Observations	2,181	2,181	2,181
R-squared	0.405		0.263
Number of id		129	129
Country FE			YES
Hausman Test			P < 0.01***

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

(3) Estimation results of interaction models

This section presents the estimation results of interaction models: Model 3 and Model 4. The dependent variables for Model 3 and Model 4 are the education expenditure and health expenditure respectively. Table 3-8 presents the results of the estimation of Model 3 in which the ratio of education expenditure to GDP is used as the dependent variable. First, in pooled OSL model (1), the interaction term between the military in politics and democracy has a positive sign (0.204) and is statistically significant at the 1%. Second, in random effect model (2), the interaction term between the military in politics and democracy has a positive sign (0.322) and is statistically significant at the 1%. Third, in fixed effect model (3), the interaction term between the military in politics and democracy has a positive sign (0.317) and is statistically significant at the 1%.

These estimation results suggest that interaction effect between the military in politics and democracy is positive that a negative effect of the military in politics on education expenditure declines in democratic countries. This result is consistent across all models presented. Moreover, the Hausman test results reject the null hypothesis at significant level 1%, suggesting that the fixed effect models are better suited to model the data.

Table 3-9 presents the results of the estimation of Model 4 in which the ratio of health expenditure to GDP is used as the dependent variable. First, in pooled OSL model (1), the interaction term between the military in politics and democracy is not statistically significant. Second, in random effect model (2), the interaction term between the military in politics and democracy has a positive sign (0.150) and is statistically significant at the 1%. Third, in fixed effect model (3), the interaction term between the military in politics and democracy has a positive sign (0.140) and

is statistically significant at the 5%.

Although the interaction effect in the pooled OLS model is not significant, it has a positive effect in both random effects and fixed effect model, suggesting that democracy actually reduces the negative effect of the military in politics on the health expenditure. Moreover, the Hausman test results reject the null hypothesis at significant level 1%, suggesting that the fixed effect models are better suited to model the data.

Table 3-8 Estimation result of Model 3
(Dependent Variable: Education Expenditure as % of GDP)

VARIABLES	(1) OLS	(2) Random Effects	(3) Fixed Effects
Military in Politics	-0.319***	-0.525***	-0.576***
	(0.0538)	(0.0642)	(0.0678)
Democracy	-0.740***	-1.534***	-1.773***
	(0.199)	(0.269)	(0.294)
Defense Expenditure	-0.194***	-0.102***	0.0295
	(0.0198)	(0.0283)	(0.0329)
GDP per capita	0.0856**	0.199**	0.575***
	(0.0415)	(0.0928)	(0.170)
Population	-0.00429	0.252***	1.588***
	(0.0255)	(0.0789)	(0.240)
Population (Age over 65+)	-6.122***	-1.618	-2.944
	(1.163)	(2.359)	(3.103)
Government Expenditure (% of GDP)	0.225***	0.175***	0.159***
	(0.00873)	(0.0129)	(0.0140)
The Military in Politics * Democracy	0.204***	0.322***	0.317***
	(0.0615)	(0.0705)	(0.0748)
Constant	2.080***	-2.048	-27.03***
	(0.587)	(1.550)	(3.700)
Observations	1,895	1,895	1,895
R-squared	0.371		0.178
Number of id		123	123
Country FE			YES
Hausman Test			P < 0.01***

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 3-9 Estimation result of Model 4
(Dependent Variable: Health Expenditure as % of GDP)

VARIABLES	(1) OLS	(2) Random Effects	(3) Fixed Effects
Military in Politics	0.0140	-0.0504	-0.0969*
	(0.0538)	(0.0541)	(0.0546)
Democracy	1.064***	-0.385	-0.585**
	(0.221)	(0.247)	(0.255)
Defense Expenditure	-0.156***	-0.00843	0.0985***
	(0.0295)	(0.0317)	(0.0328)
GDP per capita	-0.0343	0.338***	0.536***
	(0.0432)	(0.0938)	(0.132)
Population	-0.00460	0.536***	1.824***
	(0.0283)	(0.0916)	(0.189)
Population (Age over 65+)	16.32***	27.88***	31.96***
	(1.278)	(2.399)	(2.849)
Government Expenditure (% of GDP)	0.133***	0.118***	0.113***
	(0.0101)	(0.00955)	(0.00954)
The Military in Politics * Democracy	-0.0321	0.150***	0.140**
	(0.0657)	(0.0568)	(0.0576)
Constant	2.856***	-9.218***	-32.40***
	(0.645)	(1.667)	(2.894)
Observations	2,181	2,181	2,181
R-squared	0.405		0.265
Number of id		129	129
Country FE			YES
Hausman Test			P < 0.01***

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

C. Sensitivity Analysis

In most countries, the budgeting process for this year is normally started and completed in previous year. Therefore, the estimation model should be structured to reflect the characteristic of the budgeting process. Here, I expand the analysis by using next year's expenditure as dependent variable in order to reflect the budgeting characteristic and mitigate possibility of reverse causality. Table 3-10 through Table 3-13 present the results of the estimation which the ratio of expenditure_{T+1} to GDP is used as the dependent variable.

Table 3-10 presents the comparison of the fixed effect estimation results from section B and Section C. The results are consistent with the estimation results from section B. The military in politics has a negative association with the education expenditure and is statistically significant at the 1%, but it does not have a statistical association with the health expenditure. The interaction effect between the military in politics and democracy has positive association with both education and health expenditure at 1% and 5% significant level respectively.

Table 3-10 Comparison of the estimation results

Dependent Variable	Explanatory Variable	expenditure_T	Expenditure_{T+1}
Education Expenditure (% of GDP)	Military in Politics	-0.344***	-0.311***
Education Expenditure (% of GDP)	Military in Politics * Democracy	0.317***	0.266***
Health Expenditure (% of GDP)	Military in Politics	Insignificant	Insignificant
Health Expenditure (% of GDP)	Military in Politics * Democracy	0.0985***	0.140**

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 3-11 Estimation result of Sensitivity Analysis based on Model 1
(Dependent Variable:Education Expenditure as % of GDP_{t+1})

VARIABLES	(1) OLS	(2) Random Effects	(3) Fixed Effects
Military in Politics	-0.164***	-0.262***	-0.311***
	(0.0338)	(0.0377)	(0.0391)
Defense Expenditure	-0.171***	-0.0671**	0.0660**
	(0.0197)	(0.0287)	(0.0335)
GDP per capita	0.0900**	0.231**	0.571***
	(0.0424)	(0.0943)	(0.168)
Population	-0.00599	0.230***	1.490***
	(0.0259)	(0.0813)	(0.244)
Population 65+	-7.024***	-1.288	0.0778
	(1.151)	(2.370)	(3.058)
Government Expenditure (% of GDP)	0.218***	0.134***	0.107***
	(0.00896)	(0.0130)	(0.0140)
Democracy	-0.0862	-0.199	-0.336**
	(0.102)	(0.134)	(0.146)
Constant	1.697***	-2.476	-26.11***
	(0.588)	(1.569)	(3.742)
Observations	1,893	1,893	1,893
R-squared	0.344		0.126
Number of id		122	122
Country FE			YES
Hausman Test			P < 0.01***

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 3-12 Estimation result of Sensitivity Analysis based on Model 2 (Dependent Variable:Health Expenditure as % of GDP_{t+1})

VARIABLES	(1) OLS	(2) Random Effects	(3) Fixed Effects
Military in Politics	-0.00505	0.0460	-0.00770
	(0.0342)	(0.0340)	(0.0344)
Defense Expenditure	-0.0156	0.442***	0.676***
	(0.0427)	(0.0929)	(0.131)
GDP per capita	-0.00364	0.545***	1.758***
	(0.0278)	(0.0912)	(0.186)
Population	16.98***	27.64***	31.54***
	(1.229)	(2.375)	(2.804)
Population 65+	0.123***	0.0739***	0.0698***
	(0.00960)	(0.00919)	(0.00918)
Government Expenditure (% of GDP)	0.958***	0.312***	0.0909
	(0.107)	(0.106)	(0.108)
Democracy	-0.157***	0.0262	0.132***
	(0.0269)	(0.0309)	(0.0321)
Constant	2.902***	-10.10***	-32.32***
	(0.628)	(1.637)	(2.821)
Observations	2,284	2,284	2,284
R-squared	0.401		0.236
Number of id		129	129
Country FE			YES
Hausman Test			P < 0.01***

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 3-13 Estimation result of Sensitivity Analysis based on Model 3
(Dependent Variable: Education Expenditure as % of GDP_{t+1})

VARIABLES	(1) OLS	(2) Random Effects	(3) Fixed Effects
Military in Politics	-0.283***	-0.464***	-0.509***
	(0.0558)	(0.0637)	(0.0667)
Defense Expenditure	-0.182***	-0.0620**	0.0721**
	(0.0201)	(0.0287)	(0.0335)
GDP per capita	0.0865**	0.218**	0.584***
	(0.0424)	(0.0942)	(0.168)
Population	-0.00507	0.222***	1.429***
	(0.0259)	(0.0813)	(0.244)
Population 65+	-6.299***	-0.0794	0.524
	(1.181)	(2.385)	(3.049)
Government Expenditure (% of GDP)	0.220***	0.131***	0.104***
	(0.00899)	(0.0130)	(0.0139)
Democracy	-0.555***	-1.105***	-1.248***
	(0.203)	(0.267)	(0.288)
Military in Politics * Democracy	0.168***	0.271***	0.266***
	(0.0628)	(0.0691)	(0.0724)
Constant	2.016***	-1.571	-24.45***
	(0.599)	(1.587)	(3.756)
Observations	1,893	1,893	1,893
R-squared	0.346		0.133
Number of id		122	122
Country FE			YES
Hausman Test			P < 0.01***

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 3-14 Estimation result of Sensitivity Analysis based on Model 4
(Dependent Variable:Health Expenditure as % of GDP_{t+1})

VARIABLES	(1) OLS	(2) Random Effects	(3) Fixed Effects
Military in Politics	0.0249	-0.0624	-0.108**
	(0.0526)	(0.0526)	(0.0529)
Defense Expenditure	-0.150***	0.0176	0.125***
	(0.0285)	(0.0311)	(0.0322)
GDP per capita	-0.0157	0.438***	0.675***
	(0.0427)	(0.0930)	(0.131)
Population	-0.00374	0.542***	1.745***
	(0.0278)	(0.0914)	(0.186)
Population 65+	16.75***	27.99***	31.32***
	(1.267)	(2.377)	(2.802)
Government Expenditure (% of GDP)	0.122***	0.0752***	0.0710***
	(0.00979)	(0.00919)	(0.00918)
Democracy	1.099***	-0.272	-0.466*
	(0.216)	(0.241)	(0.249)
Military in Politics * Democracy	-0.0482	0.150***	0.140**
	(0.0643)	(0.0557)	(0.0564)
Constant	2.826***	-9.588***	-31.65***
	(0.635)	(1.654)	(2.830)
Observations	2,284	2,284	2,284
R-squared	0.401		0.239
Number of id		129	129
Country FE			YES
Hausman Test			P < 0.01***

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

D. Further Robustness Check

I conduct the two-step system GMM for robustness check. Table 3-15 presents the estimation results of Model 5 and Model 6 in which the ratio of education expenditure to GDP is used as the dependent variable. Both models, the results of Hansen's J test of over-identifying restriction, which tests the overall validity of the instruments, shows that it cannot reject the null hypothesis that the full set of orthogonality conditions are valid (p-value=1.000). The Arellano-Bond (2) test, which tests autocorrelations, shows that model has no second-order serial correlation in the first-differenced error term (p-value=0.2020). The estimation result of model 5 shows that the military in politics has a negative sign (-0.182) and is statically significant at the 10% level. The significant level is weak, but it is still consistent with results obtained from the Model 1. However, the estimation result of model 6, which includes the interaction effect, indicates that there is no interaction effect between the military in politics and democracy.

Furthermore, Table 3-16 presents the estimation results of Model 7 and Model 8 in which the ratio of health expenditure to GDP is used as the dependent variable. Both models, the results of Hansen's J test of over identifying restriction, which tests the overall validity of the instruments, shows that it cannot reject the null hypothesis that the full set of orthogonality conditions are valid (p-value=1.000 and 0.145). The Arellano-Bond (2) test, which tests autocorrelations, shows that model has no second-order serial correlation in the first-differenced error term (p-value=0.345 and 0.383). The estimation results of model 7 and model 8 show that there is no statistically significant relationship between the military in politics and health expenditure and there is no interaction effect between the military in politics and democracy.

Table 3-15 Estimation result of Model 5 and Model 6
(Dependent Variable: Education Expenditure as % of GDP)

VARIABLES	(1) Model 5	(2) Model 6
L. Education Expenditure	0.484***	0.491***
	(0.0676)	(0.0877)
Military in Politics	-0.182*	-0.145
	(0.0979)	(0.197)
Democracy	0.0611	-0.0434
	(0.413)	(0.795)
Defense Expenditure	-0.142	-0.129
	(0.104)	(0.0857)
GDP per capita	-0.336	-0.400
	(0.264)	(0.277)
Population	0.349	0.409
	(0.474)	(0.292)
Population 65+	-3.254	-2.411
	(5.050)	(5.620)
Government Expenditure (% of GDP)	0.194***	0.187***
	(0.0307)	(0.0301)
The Military in Politics * Democracy		-0.0115
		(0.209)
Constant	-2.652	-3.104
	(7.424)	-5.305
Arellano-Bond AR(1) Test *(p-value)*	0.000	0.000
Arellano-Bond AR(2) Test *(p-value)*	0.202	0.202
Hansen J-statistics *(p-value)*	1.000	1.000
Observations	1,533	1,533
Number of id	119	119

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 3-16 Estimation result of Model 7 and Model 8
(Dependent Variable: Health Expenditure as % of GDP)

VARIABLES	(1) Model 7	(2) Model 8
L. Health Expenditure	0.818***	0.534***
	(0.0452)	(0.0980)
Military in Politics	0.0649	-0.255
	(0.0612)	(0.376)
Democracy	0.403*	-0.0966
	(0.229)	(1.230)
Defense Expenditure	-0.0173	0.166
	(0.0681)	(0.180)
GDP per capita	0.0204	-0.428
	(0.0894)	(0.674)
Population	-0.0181	1.027*
	(0.143)	(0.614)
Population 65+	0.654	34.49**
	(2.660)	(15.02)
Government Expenditure (% of GDP)	0.0852***	0.132***
	(0.0288)	(0.0488)
The military in Politics * Democracy		0.0822
		(0.293)
Constant	-0.441	-14.86
	(2.332)	(9.122)
Arellano-Bond AR(1) Test *(p-value)*	0.000	0.001
Arellano-Bond AR(2) Test *(p-value)*	0.345	0.383
Hansen J-statistics *(p-value)*	1.000	0.145
Observations	2,082	2,082
Number of id	129	129

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

3.6. Conclusion

The government expenditure on education and health is examined by many scholars as it is believed to foster economic growth, reduce income inequality and poverty (Barro, 1991; Chu, Gupta, & Tanzi, 1999; Gupta et al., 2002). According to NGO called, Schools and Health, t*he links between health and education are reciprocal; not only is good health important for children to make the most of their educational opportunities, but the educational setting (both formal and informal) can be important in promoting good health.* The education and health are fundamental to sustainable development, especially in low-income countries, as they can improve people's productivity and ensure a better living and quality of life. Therefore, this chapter examines the impact of the military involvement in politics on education and health expenditure and investigates the role of democracy in that relationship.

In this chapter, I argue that the military in politics is the most significant institutional and political determinant of social policy through its impact on the defense expenditure that may distort the composition of government expenditure. The results show that the military in politic reduces the education expenditure. The 1-point increase in the level of the military in politics decreases about 0.34% of the education expenditure. However, I do not find that there is a statistically significant association between the military in politics and health expenditure. I also test the interaction effect between the military in politics and democracy to find the role of democracy in the military in politics and social policy relation. The results show that there is a statistically and significant interaction effect that a negative effect of the

military in politics on education expenditure and health expenditure declines in democratic countries.

In conclusion, it is revealed that the reason for low social expenditure in countries where military involvement in politics is high is due to the relatively high proportion of defense expenditure. However, such a tendency is lower in democratic countries. In other words, a negative impact of military involvement in politics that lowers the social expenditure is significantly reduced in democratic countries.

The contribution of this study is that, for the first time, it empirically shows that the political participation of the military can be a key determinant factor of social expenditure, and it further reaffirms the positive role of democracy in social expenditure that has been discussed by many scholars previously. It is confirmed once again that the role of democracy is an important factor in countries where political participation of the military is high and brings a negative social effect.

Furthermore, the direct and indirect factors that negatively affect the social expenditure of the military in the future and also examine the influence of other policy factors.

Chapter 4. The Military in Politics, Corruption, and Defense Expenditure

4.1. Introduction

Corruption is defined as the abuse of governmental power for private benefit (Bardhan, 1997; Gupta et al., 2001; Tanzi, 1998), and it has a negative impact on society and the economy as a whole, including declining productivity in the private sector, distorting public investment and eroding public resources, increasing inequality and poverty, and impeding peace and democratic development (OECD, 2016).

Particularly, in the defense sector, increasing attention has been devoted because the defense expenditure accounts for a considerable proportion of the government expenditure[7] and it has increased over time[8]. The spending government resources for defense seems inevitable and right because national defense is directly related to sovereignty of one nation and lives of its people but increasing demand of social protection limits the increase of defense expenditure, and more importantly, the allegations of corruption in the defense industry and corruption in the military are shaking up the legitimacy of defense spending.

Corruption in defense sector becomes major social issue in many countries, both

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7 The defense expenditure in United States accounts for 14% of their government expenditure and the defense expenditure in South Korea accounts for 13.9% of the total government expenditure. The world's average is 6.1%.

8 The world defense expenditures in 1960s and in 2016 are estimated $688 billion (3.3 % of GDP) and $1,686 billion (2.1% of GDP) respectively.

developed and developing countries, and reported scandals include the United States, Japan, Italy, China, Ukraine, Nigeria, Angola, South Korea, France, Germany, Mexico, Philippines, and Kenya (Majeed & Macdonald, 2010). According to Tanzi (1998), bribes account for as much as 15% of the weapon procurement. Moreover, Shleifer and Vishny (1993) and Hines (1995) argued that specialized and high-technology goods are susceptible to corruption, and defense goods fall into that category. These issues raise the importance of the efficient management of defense expenditure and resources in order to maximize the military power under the budget constraints and, at the same time, enhance the military deterrence.

However, studies that examine the impact of corruption on the defense expenditure is almost nonexistent. To my knowledge, the research conducted by Gupta et al. (2001) is the only research that examined the direct relationship between corruption and defense expenditure. Therefore, this chapter examines how corruption affects the defense expenditure and empirically investigates its relationship. Does corruption increase the defense expenditure? In other words, is defense expenditure susceptible to corruption? What is the role played by military involvement in politics in the association between corruption and defense expenditure? These are the central questions of this chapter, and this would enhance the understanding of corruption and its effects in policy decision process.

The paper is organized as follows: the next section provides a review of the relevant literature. Section III provides a discussion of the empirical strategy including a description of panel data set and methodology. Section IV presents the empirical findings and Section V concludes.

4.2. Literature Review

A. Why is a defense sector the most vulnerable to corruption?

The government does not always act in citizen's best interest and corruption affects the government expenditure. Corrupt politicians are expected to put more public resources on items that are easier to levy a large bribe and keep it secret and there is the existence of rents that motivate rent-seeking behaviors (Krueger, 1974). Shleifer and Vishny (1993) and Hines (1995) argued that specialized and high-technology goods are susceptible to corruption. It includes weapons, radar, aircraft, and vessels etc. Especially, in defense sector, making expenditure activities as transparent as possible, at a level that does not harm national security by disclosing classified information, is very important because defense sector is the most vulnerable to corruption as Perlo-Freeman (2016) mentioned, "in many countries, the military tends to be one of the most corrupt sectors of government, and arms procurement—domestic and international—is especially subject to corruption, in both developed and developing countries." Corruption in defense sector affects all of us, not merely a malfeasant behavior by officials or commissioning of sales, but a direct threat to the lives of citizens and soldiers. It also impedes an efficient resource allocation in the defense sector, causing social loss, and diminishes people's trust in the government.

There are five potential problems in defense sector: 1) lack of effective policy and planning, 2) weak civilian and democratic control, 3) sensitivity or security concerns, 4) extra-budgetary and off-budget military spending, and 5) monitoring, control and auditing (Perlo-Freeman, 2016). Resource allocation and procurement

process should be well-managed to meet a defense policy goal. However, in many cases, resource allocation and procurement process are made without a well-defined defense policy which increases a risk of corruption. Military tend to keep their defense activities, including a defense budgeting and procurement, undisclosed and prevent monitoring, controls, and audits for security reasons, and a stable and efficient civil-military relation is not achieved yet for developing countries. Thus, an oversight of defense activity by civilian is weak, resulting defense sector more vulnerable to corruption.

Gupta et al. (2001) well illustrated how corruption can affect the military spending through various channels (p.751-753). First, in supply-side considerations, bribery from suppliers to government officials is a major issue. As military spending falls down throughout the world, competition among arms suppliers is increased. This trend makes suppliers to aggressively scout for market opportunities by resorting to bribery. Second, in demand-side considerations, a characteristic of defense sector is vulnerable to corruption. For instance, defense contracts are often kept in secrecy and it is not subject to disclosure. There are not many arms suppliers, and limited competition provides incentives for officials to engage in misconducts. Also, companies producing military equipment and supplies are engaged in strong network chains with former high-ranked officers and officials. Finally, military-controlled land, facilities, and equipment are large and provide opportunities for corruption.

The trends of defense expenditure make suppliers resorting to bribery and the limited competition in the defense sector leads to a high level of informal contracts and to rent-seeking activities. This could increase the cost of military activities and reduce the efficient allocation of resources.

B. Corruption and Social and Economic Outcome

A relationship between corruption and better economic and social outcomes is increasingly acknowledged (Bastida & Benito, 2007). Many scholars examined the impact of transparency and corruption on a range of economic and political and institutional outcomes. Bertot, Jaeger, and Grimes (2010) claimed that it is "regarded as essential to democratic participation, trust in government, informed decision-making, accuracy of government information, and provision of information to the public, companies, and journalists, among other essential functions in society" (p. 264) Empirical studies show that government transparency has a positive effect on monetary institutions (Stasavage, 2003) and reduces leaking and corruption (Bac, 2001; De Jong & de Vries, 2007; Kolstad & Wiig, 2009; Lindstedt & Naurin, 2010), and the relationship between transparency and governance or institutional quality and concluded that countries with high transparency have better governance (Islam, 2003).

Economists also investigated the impact of government transparency on economic outcome. Empirical results show that government transparency has a significant impact on fiscal balance and performance, foreign direct investment, and gross domestic product (Alt & Lassen, 2006; Benito & Bastida, 2009; Drabek & Payne, 2002; John Hongxin, Kim, & Du, 2003; Kurtzman, Yago, & Phumiwasana, 2004). Transparency increases accountability in central banks by reducing the asymmetry of information between the public and the bank (Geraats, 2002), and it is related to economic development, financial markets, political economy, regulation, and trade (C. Ball, 2009).

Studies focus on economic outcomes analyzed the impact of corruption on, among other things, economic development and growth (Aidt, 2009; Leff, 1964;

Mauro, 1995), aid (Collier & Dollar, 2002), government expenditure and debt (Cooray, Dzhumashev, & Schneider, 2017; Goel & Nelson, 1998; Liu & Mikesell, 2014; Mauro, 1998), foreign direct investment (John Hongxin et al., 2003). Moreover, studies focus on political and institutional outcomes analyzed the impact of corruption on, among other things, delivery of public services (E Warren, 2004), regime legitimacy (Seligson, 2002), voter turnout (Stockemer, LaMontagne, & Scruggs, 2013), democratic participation and social trust (Rothstein & Eek, 2009; Rothstein & Teorell, 2008).

In general, most economists would agree that corruption has a negative impact on economic outcomes and is harmful to a society. However, few scholars refuted the argument that corruption would raise economic growth by increasing efficiency in the public sector (Acemoglu & Verdier, 1998; Huntington, 1968; Leff, 1964; Leys, 1965; Lui, 1985). Leff (1964) was one of the first scholars who argued that corruption increases the social welfare by facilitating activities of government, especially in countries in which bureaucratic rules are strict. Acemoglu and Verdier (1998), Huntington (1968), Leys (1965), and Lui (1985) supported the argument that corruption raises economic growth. There are two mechanisms that corruption might increase economic growth. First, the most common corrupt practice, "bribing", would allow individuals or firms to get away with bureaucratic delay and inefficient rules. Second, government officials who received bribes would work harder and this would increase productivities.

On the other hand, the majority of empirical studies showed that corruption reduces efficiency and lowers economic growth (Aidt, 2009; D'Agostino, Dunne, & Pieroni, 2016; Dzhumashev, 2014; Mauro, 1995, 1996; Mo, 2001; Myrdal, 1968; Pecorino, 1992). Mauro (1995) analyzed the magnitude of the effect of corruption

on economic growth using corruption indices for 67countires from the Business International (BI). Controlling for all variables used in Barro (1991) and the political stability index, he found that corruption has a negative impact on both investment and economic growth. Mo (2001) conducted ordinary least squares (OLS) estimations and found that corruption reduces growth through political instability channel using panel data covering 58 countries over the period 1980-1985. Population, GDP per capita, political rights, education, political stability, and investment variables were controlled for the analysis. He obtained corruption perception index (CPI) from the Transparency International (TI) which ranges from 0 to 10 with (0) indicating a highly corrupt country and (10) indicating a highly clean country. Most recent study by D'Agostino et al. (2016) used the dataset covering 106 countries over the period 1996-2010 to examine the relationship between corruption and economic growth. Controlling for political stability, regulation quality, and trade openness variables, he found that interaction between corruption and military spending has a strong negative impact on economic growth. They obtained and used three different corruption indices for analysis: corruption index from the World Bank, CPI from TI and corruption index from the International Country Risk Guide (ICRG).

In addition, there are other studies that examine economic outcomes of corruption focusing on the government expenditure. Mauro (1998) examined the relationship between corruption and government expenditure based on panel data for 100 countries over the period 1982-1995. Controlling for political stability and GDP per capita, he found that corruption reduces government expenditure on education. Cooray et al. (2017) also investigated the relationship between corruption and public debt based on panel data for 126 countries over the period 1996-212 using ordinary

least squares, fixed effects, system generalized method of moments, and instrumental variable estimation. Controlling for Secondary enrollment, per capita income, government expenditure, interest payments and polity index, he found that corruption has a positive impact on government debt through government expenditure and suggested reducing corruption should be the main policy goal because it decreases both government expenditure and debt.

Although increasing attention has been devoted to understanding the consequences of corruption, studies that examine the impact of corruption on the defense expenditure are almost nonexistent. To my knowledge, the research conducted by Gupta et al. (2001) is the only research that examined the direct relationship between corruption and defense expenditure. He constructed panel data from four different sources for 120 countries over the period 1985-1998 and analyzed the impact of corruption on defense expenditure using pooled OLS, fixed effects, and random effects estimations. Two-stage least squares (2SLS) and generalized method of moments (GMM) were also used to deal with possible reverse causality biases. Controlling for education, GDP per capita, age dependency ration, urbanization rate, size of armed forces, military spending of neighbor countries, and government spending, he found that corruption is related to higher defense expenditure as a share of both GDP and total government spending.

4.3. Empirical Strategy: Data, Variables and Models

A. Data and Variables

I have constructed a balanced panel data set covering 129 countries for the period

from 1984 to 2013. The countries considered are those for which both the military in politics information and military expenditure information exists in the ICRG and SIPRI database. The data for this chapter come from various sources as organized in table 4-1.

First, the independent variable, the military in politics, measures the involvement of the military in politics and is from the International Country Risk Guide (ICRG)[9] which is very commonly used in academia since its first publication in 1984. Howell (2011) states that "s*ince the military is not elected, involvement, even at a peripheral level, diminishes democratic accountability. Military involvement might stem from an external or internal threat, be symptomatic of underlying difficulties, or be a full-scale military takeover. Over the long term, a system of military government will almost certainly diminish effective governmental functioning."*

The corruption variable is also from the International Country Risk Guide (ICRG). Corruption index measures the corruption level within the political system. Both variables use 7 points scales, with the highest number of points (6) indicating the highest corruption and military in politics level and the lowest number (0) indicating the lowest corruption and military in politics level highest potential risk.

The dependent variable, the defense expenditure, is obtained from the Stockholm International Peace Research Institute (SIPRI). SIPRI has produced very reliable defense sector data since 1949 and it contains consistent time series on the defense expenditure. The control variables are the gross domestic product (GDP) per capita,

[9] The developer of PRS data, Howell (1998), stated that "most data in country and political risk is what we call expert data (and not, as is often asserted, just opinion)" and argued "expert data is systematically derived from country specialists with high levels of training and decades of experience."

population, age-dependency ratio, government expenditure, military personnel, arms import, democracy, and previous war. The data for GDP per capita, population, age-dependency ratio, and government expenditure are from the world development indication (WDI) provided the World Bank. The GDP per capital uses the constant 2010 U.S. dollar price. The natural log value is taken for the GDP per capita, population, and the government expenditure is measured as a percentage of the GDP. The age-dependency ratio measures a percentage of the working-age population and is the ratio of dependents: people younger than 15 or older than 64 to the working-age population of those ages 15-64. The arm import data is measured as a percentage of GDP and obtained from SIPRI. The military personnel variable is from the military balance published by the International Institute for Strategic Studies (IISS). It measures the total number of armed forces and takes the natural log value. Lastly, variables for democracy and previous war are from the polity VI project. I have constructed dummy variables based on the polity VI data: the democracy variable takes the value of 1 if the democratic country and 0 if the authoritarian country.

Table 4-1 List of variables and its measurement

Variables		Measurement	Definition	Source
Independent Variable	Military in Politics	Low - High (0 – 6)	Involvement of the military in politics	International Country Risk Guide (ICRG)
	Corruption		Assess the level of corruption	
Dependent Variable	Defense Expenditure	% of GDP	Data for Defense Expenditure as a percentage of GDP	SIPRI
Control Variable	GDP per Capita	Ln GDP per capita	Measured as GDP per capita (US $ 2010 constant)	World Development Indicator
	Population	Ln Population	Total Population	
	Age Dependency Ratio	% of Working-age Population	Age dependency ratio is the ratio of dependents: people younger than 15 or older than 64 to the working-age population of those ages 15-64	
	Government Expenditure	% of GDP	Government Expenditure as a percentage of GDP	
	Military Personnel	Ln # of Armed Forces	Total Number of Armed Forces	The Military Balance (IISS)
	Arms Import	% of GDP	Data for Arms Imports as a percentage of GDP	SIPRI
	Democracy	Dummy variable	A dummy variable taking the value of 1 if the democratic country and 0 if the authoritarian country	Polity IV
	Previous War	Dummy Variable	A dummy variable taking the value of 1 if the country has been involved in a war previously 0 if the country has not been involved in a war	

B. Empirical Model

The estimation model is based on the theoretical model used by Albalate et al. (2012). The GDP per capita, which measures the country's level of economic development, is added considering Wagner's Law, which states that public sector grows as a nation becomes richer(Hessami, 2014). I also add the ratio of government expenditure to GDP, which is routinely used as a control variable in the government expenditure equation (Gupta et al., 2001).

Model 1: The Defense Expenditure (% of GDP)

$$\text{Defense Expenditure}_{i,t} = \alpha_0 + \beta_1(\text{Mil\_Pol})_{i,t} + \beta_2(\text{PW})_{i,t} + \beta_3(\text{LnGDPP})_{i,t} + \beta_4(\text{LnPOP+})_{i,t} + \beta_5(\text{Age\_Dep})_{i,t} + \beta_6(\text{Demo})_{i,t} + \beta_7(\text{Govt\_Exp\_GDP})_{i,t} + \beta_8(\text{Arms\_Im})_{i,t} + \beta_9(\text{Interaction})_{i,t} + \delta_i + \varepsilon_{i,t}$$

$Mil\_Pol_{i,t}$= Military in Politics

$PW_{i,t}$= Previous War

$LnGDPP_{i,t}$= ln(GDP per capita)

$LnPOP_{i,t}$= ln(Population)

Age_DEP= Age-Dependency Ratio

$Govt\_Exp\_GDP_{i,t}$= Government expenditure as a percentage of GDP

$Demo_{i,t}$= Democracy

$Arms\_Im_{i,t}$= Arms Imports as a percentage of GDP

$\boldsymbol{Interaction_{i,t}}$**= Military in Politics * Corruption**

δ_i = Individual-specific variable

$\varepsilon_{i,t}$ = Error term

C. The Dynamic Panel estimation for Robustness Check

The dynamic panel estimation is conducted for further robustness check. The estimator from the dynamic panel estimation is more consistent for panel data with small time periods, 'small T,' and many individual units, 'large N.' The dynamic panel estimation includes lagged levels of the dependent variable as regressors, and it can be represented as follow:

$$Y_{it} = \alpha + Y_{it-1} + \beta x_{it} + \delta_i + \epsilon_{it}$$

Here, Y is a dependent variable observed for individual i at time t, α is a constant, β is a regression coefficient, x is an independent variable, δ is an individual-specific and time-invariant effect which are fixed over time, ϵ is an error term. However, in dynamic panel estimation, both the fixed effect and random effect cannot be used. Nickell (1981) has shown that the fixed effect creates a bias in the estimate of the coefficient of the lagged dependent variable. Within transformation process which subtracts the individual's mean value of y and each x from the respective variable inevitably creates a correlation between the explanatory variable and error term. The mean of the lagged dependent variable contains observations 0 through (T − 1) on y, and the mean error, which is being conceptually subtracted from each ϵ_{it}, contains contemporaneous values of ϵ for t = 1 . . . T.

Moreover, in the random effect estimation, the lagged dependent variable contains δ_i, an individual-specific and time-invariant effect which is fixed over time. Consequently, Cov(Y_{it-1}, δ_i) $\neq 0$ because both error term and the explanatory variable contain δ_i, and it does not satisfy the basic assumption of the random effect estimation, Cov(x_{it}, δ_i)= 0. The random effect cannot be used in dynamic panel

estimation.

In the dynamic panel estimation, where the lagged dependent variable is included, generalized method moments (GMM) should be used for analysis. Arellano and Bond (1991) have first developed difference GMM method for the dynamic panel analysis and Windmeijer (2005) later has developed system GMM which is widely used in recent works. In the system GMM, the consistency of estimator depends on the validity of the instruments. Thus, following two specification tests are preferred. The first is a Hansen J-test of over-identifying restrictions, which tests the overall validity of the instruments and the second is the Arellano-Bond test for autocorrelation (Woo & Kumar, 2015). Moreover, the two-step system GMM requires to use the robust error (Windmeijer, 2005), otherwise, the estimator is not a consistent estimator and biased.

Therefore, in this chapter, the two-step system GMM is used for the dynamic panel analysis and robustness check. Both Hansen J-test of over-identifying restrictions and Arellano-Bond test will be conducted and the robust error will be used for the analysis. The model 3 and model 4 represent the estimation equation used for the dynamic panel analysis.

Model 2 The Defense Expenditure (% of government expenditure)

$$\text{Defense Expenditure}_{i,t} = \alpha_0 + \beta_1(\text{DE})_{i,t-1} + \beta_2(Mil\_Pol)_{i,t} + \beta_3(\text{PW})_{i,t} + \beta_4(\text{Ln}GDPP)_{i,t} + \beta_5(\text{LnArmed})_{i,t} + \beta_6\left(\text{Age}_{\text{Dependency}}\right)_{i,t} + \beta_7(\text{Demo})_{i,t} + \beta_8\left(\text{Govt}_{\text{Exp}_{\text{GDP}}}\right)_{i,t} + \beta_9\left(\text{Arms}_{\text{Imports}}\right)_{i,t} + \beta_{10}(\text{Interaction})_{i,t} + \delta_i + \varepsilon_{i,t}$$

$\text{DE}_{i,t-1}$= The lagged defense expenditure

$Mil\_Pol_{i,t}$= Military in Politics

$PW_{i,t}$= Previous war

$LnGDPP_{i,t}$= ln(GDP per capita)

$LnPOP_{i,t}$= ln(Population)

$Govt\_Exp\_GDP_{i,t}$= Government expenditure as a percentage of GDP

$LnArmed_{i,t}$= ln(Total number of armed-forces)

$Demo_{i,t}$= Democracy

$\boldsymbol{Interaction_{i,t}}$**= Military in Politics * Corruption**

δ_i = Individual-specific variable

$\varepsilon_{i,t}$ = Error term

4.4. Empirical Results

A. Basic Analysis Result

Table 4-2 shows the descriptive statistics of variables for countries from 1984 to 2013. Based on the empirical model, 129 countries are subject to analysis, but the analysis of up to 134 countries is shown in descriptive statistics. The mean, standard deviation, minimum, and maximum of variables are displayed, and upper case 'N' represents total observations, low case 'n' represents a total number of country, and Year refers to the average observation periods. Of these values, the meaning of the standard deviation is important, and there are three different standard deviations in panel data. First one is a between standard deviation, which is the difference between the countries that are analyzed. The second one is a within the standard deviation, which is a variation that changes over time in one country. The third one is an overall standard deviation, which is a variation of all of the data points in the panel data.

Typically, a deviation between countries is larger than a deviation within a country, which means that there is a greater deviation of data across countries than data deviations within a country over time. Nonetheless, a deviation between countries for the defense expenditure and previous war variables is smaller than a deviation within a country. In addition, the ratio of the standard deviation within the country to the standard deviation between countries provides a better understanding the nature of the data. The population variable has the lowest ratio of the standard deviation within the country to the standard deviation between countries. Whereas, the previous war variable has the highest ratio of the standard deviation within the country to the standard deviation between countries.

For the dependent variable, defense expenditure as a percentage of GDP, the between countries standard deviation is 2.24 and the within-country standard deviation is 2.99 and the ratio is 1.33. The independent variable, corruption, has the between countries standard deviation of 1.10 and the within-country standard deviation of 0.72 and the ratio of 0.65. The military in politics variable has the between countries standard deviation of 1.61 and the within-country standard deviation of 0.80 and the ratio of 0.49. The previous war variable has the between countries standard deviation of 0.066 and the within-country standard deviation of 0.142 and the ratio of 2.14. The population variable has the between countries standard deviation of 1.50 and the within-country standard deviation of 0.17 and the ratio of 0.11. The arms import variable has the between countries standard deviation of 1.61 and the within-country standard deviation of 0.37 and the ratio of 0.23. The GDP per capita variable has the between countries standard deviation of 1.53 and the within-country standard deviation of 0.24 and the ratio of 0.15. The government expenditure variable has the between countries standard deviation of 5.16 and the

within-country standard deviation of 3.47 and the ratio of 0.67. The size of the military has the between countries standard deviation of 1.61 and the within-country standard deviation of 0.37 and the ratio of 0.22. The democracy variable has the between countries standard deviation of 0.39 and the within-country standard deviation of 0.27 and the ratio of 0.69.

Table 4-3 shows the correlation analysis result. The correlation between the dependent variables and other variables is as follows. The dependent variable, the defense expenditure as a percentage of GDP, has a positive but is not significant correlation with the independent variable, the corruption, and its correlation coefficient is 0.0251. It has a positive correlation with the military in politics, and its correlation coefficient is 0.100. The dependent variable has a negative correlation with the socio-economic control variables, GDP per capita and population, and their correlation coefficients are -0.0031 and 0.171 respectively, but have a positive correlation with the age-dependency ratio, and its correlation coefficient is -0.117. The defense expenditure has a positive correlation with threat factor and their correlation coefficient is 0.0468. In addition, the dependent variable has a positive correlation with military budget factors, the size of military personnel and arms import, and their correlation coefficients are 0.0910 and 0.171 respectively. It also has a positive correlation with government expenditure as a percentage of GDP, and its correlation coefficient is 0.325.

Table 4-2 Descriptive Statistics

Variable		Mean	S.D	Min	Max	Observations
Defense Expenditure (% of GDP)	overall	2.68518	3.76922	0	117.388	N=3450
	between		2.24106	0	14.1404	n=133
	within		2.99136	-7.0453	107.336	Year=25.9398
Military in Politics	overall	2.33018	1.81821	0	6	N=3760
	between		1.61636	0	5.686	n=134
	within		0.80236	-0.3991	6.36918	Year=28.0597
Corruption	overall	3.062777	1.329395	0	6	N=3760
	between		1.105403	0.02766	5.33467	n=134
	within		0.724107	0.80691	5.42811	Year=28.0597
Previous War	overall	0.02537	0.15728	0	1	N=4020
	between		0.06644	0	0.46667	n=134
	within		0.14267	-0.4413	0.99204	T=30
Ln Population	overall	16.2453	1.50832	12.741	21.0288	N=4011
	between		1.50224	12.9737	20.9245	n=134
	within		0.17842	15.3523	17.4073	Year=29.9328
Arms Import	overall	10.87521	1.654757	3.91202	15.235	N=3343
	between		1.613191	6.81876	15.0506	n=134
	within		0.370333	6.71776	12.7720	Year=24.9478
Ln GDP per Capita	overall	8.38407	1.56251	4.75181	11.626	N=3732
	between		1.53495	5.4235	11.3008	n=132
	within		0.24502	7.16887	9.64426	Year=28.2727
Government Expenditure (% of GDP)	overall	15.9397	6.20683	0	76.2221	N=3634
	between		5.16409	4.78889	32.1678	n=133
	within		3.47778	-0.1629	66.163	Year=27.3233
Size of the military	overall	10.8752	1.65476	3.91202	15.235	N=3343
	between		1.61319	6.81876	15.0506	n=134
	within		0.37033	6.71776	12.772	Year=24.9478
Democracy	overall	0.64901	0.47734	0	1	N=4020
	between		0.39234	0	1	n=134
	within		0.27393	-0.3177	1.61567	T=30

Table 4-3 Correlation Analysis Result

	Corruption	Military in Politics	Defense Expenditure (% of GDP)	Previous War	GDP per capita	Population	Military Personnel	Democracy	Government Expenditure (% of GDP)	Arms Import	Age Dependency Ratio
Corruption	1										
Military in Politics	0.605***	1									
Defense Expenditure (% of GDP)	0.0251	0.100***	1								
Previous War	-0.00874	0.0676**	0.0468*	1							
GDP per capita	-0.615***	-0.690***	-0.00311	-0.0831***	1						
Population	0.169***	0.243***	-0.129***	0.171***	-0.271***	1					
Military Personnel	0.107***	0.186***	0.0910***	0.163***	-0.0693**	0.833***	1				
Democracy	-0.336***	-0.342***	-0.246***	0.0169	0.341***	0.0177	-0.0460*	1			
Government Expenditure (% of GDP)	-0.409***	-0.443***	0.325***	-0.0362	0.454***	-0.305***	-0.178***	0.0987***	1		
Arms Import	-0.173***	-0.0852***	0.171***	0.151***	0.263***	0.467***	0.619***	-0.0227	0.0532*	1	
Age-Dependency Ratio	0.325***	0.529***	0.117***	0.0713**	-0.715***	0.0716**	-0.151***	-0.290***	-0.132***	-0.285***	1

$^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

B. Estimation Results

This section presents the estimation results of interaction model. Table 4-7 presents the results of the estimation of Model 1 in which the ratio of defense expenditure to GDP is used as the dependent variable. First, in pooled OSL model (1), the interaction term between the military in politics and corruption has a negative sign (-0.181) and is statistically significant at the 1%. Second, in random effect model (2), the interaction term between the military in politics and corruption has a negative sign (-0.126) and is statistically significant at the 1%. Third, in fixed effect model (3), the interaction term between the military in politics and corruption has a negative sign (-0.108) and is statistically significant at the 1.

These estimation results suggest that in countries where the level of military in politics are the same, countries with a high level of corruption have lower defense expenditure than countries with low level of corruption. Moreover, the Hausman test results reject the null hypothesis at significant level 1%, suggesting that the fixed effect models are better suited to model the data. Table 4-6 shows the summary of fixed effect model result.

Overall, the estimation results are mixed: the OLS estimation result shows that corruption is positively correlated with the defense expenditure, but the fixed effect and random effect estimation results indicate that corruption is negatively correlated with the defense expenditure. Thus, I conduct the Breusch-Pagan Lagrange multiplier (LM) test to choose between the random effect model and OLS model. The null hypothesis in the LM test is that variances across entities are zero, which means that there is no panel effect. The LM test rejects the null and concludes that random effect model is appropriate. That is, evidence of significant differences across countries, therefore running OLS estimation is not appropriate.

Furthermore, I also conduct the Hausman test and reject the null hypothesis at significant level 1%, suggesting that the fixed effect models are better suited to model the data. I conclude that corruption is negatively related to the defense expenditure. That is, a higher level of corruption is associated with a decrease in the defense expenditure. Table 4-4 shows the summary of fixed effect model result.

Table 4-4 Fixed Effect Model Result

Variables	**Relationship with the Defense Expenditure**
Military in Politics	Positive***
Previous War	Negative, but not significant
Population	Negative***
GDP per Capita	Negative**
Size of the military	Positive***
Age Dependency Ratio	Positive, but not significant
Government Expenditure % of GDP	Positive***
Democracy	Positive, but not significant
Arms Imports	Positive***
Military in Politics * Corruption	Negative***

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4-5 Estimation result of Model
(Dependent Variable: Defense Expenditure as % of GDP)

VARIABLES	(1) OLS	(2) Random Effects	(3) Fixed Effects
Military in Politics	0.945***	0.679***	0.604***
	(0.109)	(0.114)	(0.117)
Previous War	0.456	-0.0975	-0.167
	(0.353)	(0.302)	(0.303)
GDP per capita	-0.182**	-0.498***	-0.568**
	(0.0764)	(0.159)	(0.264)
Population	-1.304***	-1.108***	-1.858***
	(0.0819)	(0.182)	(0.471)
Size of Military Personnel	1.152***	0.926***	0.691***
	(0.0873)	(0.142)	(0.170)
Age-Dependency Ratio	0.0325***	0.0257***	0.0156
	(0.00523)	(0.00787)	(0.0101)
Democracy	-0.932***	-0.170	0.0321
	(0.145)	(0.222)	(0.246)
Government Expenditure (% of GDP)	0.197***	0.349***	0.372***
	(0.0128)	(0.0180)	(0.0193)
Arms Imports	0.295***	0.184***	0.164***
	(0.0412)	(0.0384)	(0.0388)
Military in Politics * Corruption	-0.181***	-0.126***	-0.108***
	(0.0246)	(0.0252)	(0.0260)
Constant	2.645**	4.275	20.64**
	(1.215)	(3.143)	(8.065)
Observations	2,058	2,058	2,058
R-squared	0.378		0.246
Number of id		124	124
Country FE			YES
Hausman Test			P < 0.01***

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

C. Sensitivity Analysis

In most countries, the budgeting process for this year is normally started and completed in previous year. Therefore, the estimation model should be structured to reflect the characteristic of the budgeting process. Here, I expand the analysis by using next year's expenditure as dependent variable in order to reflect the budgeting characteristic and mitigate possibility of reverse causality.

I conduct the Breusch-Pagan Lagrange multiplier (LM) test to choose between the random effect model and OLS model. The LM test rejects the null and concludes that random effect model is appropriate. That is, evidence of significant differences across countries, therefore running OLS estimation is not appropriate. I also conduct the Hausman test and reject the null hypothesis at significant level 10%, suggesting that the fixed effect models are better suited to model the data.

Table 4-6 presents the comparison of the fixed effect estimation results from section B and Section C. The results are consistent with the estimation results from section B. The corruption is negatively associated with the defense expenditure at 1% significant level, and the interaction effect between the military in politics and corruption has a negative sign and is statistically significant at 5%.

Table 4-6 Comparison of the estimation results

Dependent Variable	**Explanatory Variable**	$\mathbf{Expenditure}_{T}$	$\mathbf{Expenditure}_{T+1}$
Defense Expenditure (% of GDP)	Military in Politics * Corruption	-0.108***	-0.0805***

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4-7 Estimation Result of Sensitivity Analysis
(Dependent Variable: Defense Expenditure as % of Government Expenditure$_{t+1}$)

VARIABLES	(1) OLS	(2) Random Effects	(3) Fixed Effects
Military in Politics	0.785***	0.490***	0.390***
	(0.110)	(0.121)	(0.127)
Previous War	0.564	0.0359	-0.0212
	(0.355)	(0.326)	(0.331)
GDP per capita	-0.0590	-0.148	-0.0528
	(0.0769)	(0.148)	(0.288)
Population	-1.332***	-1.308***	-2.056***
	(0.0822)	(0.166)	(0.522)
Size of Military Personnel	1.226***	1.243***	1.163***
	(0.0880)	(0.142)	(0.184)
Age-Dependency Ratio	0.0354***	0.0325***	0.0248**
	(0.00527)	(0.00799)	(0.0110)
Democracy	-1.212***	-1.028***	-0.964***
	(0.146)	(0.226)	(0.266)
Government Expenditure (% of GDP)	0.133***	0.162***	0.163***
	(0.0129)	(0.0188)	(0.0212)
Arms Imports	0.226***	0.134***	0.115***
	(0.0415)	(0.0413)	(0.0424)
Military in Politics * Corruption	-0.161***	-0.104***	-0.0805***
	(0.0247)	(0.0265)	(0.0282)
Constant	3.572***	5.162*	18.53**
	(1.221)	(2.767)	(8.886)
Observations	2,056	2,056	2,056
R-squared	0.322		0.110
Number of id		125	125
Country FE			YES
Hausman Test			P < 0.1*

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

D. Further Robustness Check

I conduct the two-step system GMM for robustness check. Table 4-8 shows the estimation result of Model 2 in which the ratio of defense expenditure to GDP is used as the dependent variable. The result shows that the interaction term has a negative sign and is statistically significant at 5% level. The result is consistent with the results from the OLS, fixed-effect, and random effect estimation. The corruption actually decreases the defense expenditure.

The result of Hansen's J test of over-identifying restriction, which tests the overall validity of the instruments, shows that it cannot reject the null hypothesis that the full set of orthogonality conditions are valid (p-value=1.000). The Arellano-Bond (2) test, which tests autocorrelations, shows that model has no second-order serial correlation in the first-differenced error term (p-value=0.470).

Table 4-8 Estimation result of Model 2
(Dependent Variable: Defense Expenditure as % of GDP)

VARIABLES	SGMM
L. Defense Expenditure	0.0950
	(0.104)
Military in Politics	0.724*
	(0.406)
Previous War	0.0639
	(0.133)
GDP per capita	0.553
	(0.594)
Population	-0.0338
	(0.616)
Size of Military Personnel	0.920
	(0.560)
Age Dependency Ratio	0.107***
	(0.0399)
Democracy	-1.653*
	(0.873)
Government Expenditure (% of GDP)	0.0826**
	(0.0417)
Arms Imports	0.0410
	(0.0362)
Military in Politics * Corruption	-0.167**
	(0.0845)
Constant	-20.03
	(14.03)
Arellano-Bond AR(1) Test *(p-value)*	.087
Arellano-Bond AR(2) Test *(p-value)*	.505
Hansen J-statistics *(p-value)*	1.000
Observations	2,037
Number of id	124

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

4. 5. Conclusion

It has been argued that corruption causes the deterioration of efficiency and effectiveness of the public sector by allowing public investment to concentrate on areas that maximize the pursuit of corrupted officials' interests rather than demand or investment value (d'Agostino, Dunne, & Pieroni, 2012; Gupta et al., 2001; Mauro, 1998; OECD, 2016). Therefore, in this chapter, I have empirically tested whether above statement is true as the defense sector is known to be susceptible to corruption.

The result indicates that corruption is associated with lower defense expenditure as a percentage of GDP. In other word, countries perceived as being more corrupt tend to spend less for the defense expenditure. Although caution is needed to accept the empirical evidence due to the data limitation, the result shown in this chapter is persuasive as the data used for analysis covers the long period of time and more countries than any other literature in related fields.

The result suggests that the bureaucrats in countries with high level of corruption are able to carry out their interests regardless of financial items. Instead of defense expenditure which is under the military control, especially in countries with high military involvement in politics, the bureaucrats may be seeking their own interests in other financial items, such as the social overhead capital (SOC). Therefore, defense expenditure may be relatively low.

Chapter 5. Conclusion

This dissertation develops the theory of military in politics, which has not been examined in past as the institutional and political determinant, to explain the policy gaps between countries and provide the empirical evidence. First, I established the theoretical link between the military in politics and defense policy and supported with empirical evidence. Second, I examined the impact of the military in politics on the social policy and the role of democracy. Third, I examined the moderating effect of corruption in the relationship between the military in politics and defense expenditure.

In the first chapter, it is found that the military in politics is a key determinant of defense policy. The defense expenditure and military service system are selected as proxy measures for defense policy, and the empirical results indicate that the military in politics increases the demand for defense expenditure and the likeliness to keep the conscription system.

The second chapter argues that the military in politics is the most significant institutional and political determinant of social policy, and the education expenditure and health expenditure are used as proxy measures for social policy. It is found that the social policy is weak in countries where military involvement in politics is high, but such a tendency is lower in democratic countries. In other words, a negative impact of military involvement in politics that lowers the social expenditure is significantly reduced in democratic countries.

In the third essay, I investigate the relationship between corruption and defense expenditure considering the impact military in politics. The empirical result indicates

that corruption is associated with lower defense expenditure as a percentage of GDP. The interaction effect between the military in politics and corruption has a negative sign which implies that the military in politics that increases the defense expenditure is significantly reduced in more corrupted countries.

The contribution of this study is that it considers the military in politics which has not been examined in past as the institutional and political determinant of policy. The previous literature has examined the institutional and political factors derived from democracy such as an electoral system, parliamentary system, and autocracy as policy determinants, but this study clearly shows that the military in politics is a key determinant of policy that must be considered. Notably, the democracy factor is not even statistically significant in some models.

Furthermore, it reaffirms the positive role of democracy that has been discussed by many scholars previously. It is confirmed once again that the role of democracy is an important factor in countries where political participation of the military is high and brings a negative social effect. The direct and indirect factors that negatively affect the social expenditure of the military in the future and also examine the influence of other policy factors.

5. 1. Policy Implication

First, this dissertation enhances the understanding of military institutions in policy-decision process by showing that the military in politics is a key variable and major political and institutional determinant of defense policy. It is due to the military's preference which favors more aggressive policy, collectivism to increase the military's share of national resources, and personal ambition to hold top

bureaucratic position in which affect the defense policy. Democracy is found to be statistically insignificant considering the military in politics factors, in contrast to the results in previous literatures. Understanding the impact of the policy environment on policy is vital for good and right policy. And, based on this understanding, it requires efforts to improve the structure and process of the political system. Therefore, the political involvement by the military in the policy decision process, especially in defense policy, should be considered to fully understand the policy environment.

Second, I reaffirmed that democracy is a universal value that empowers individuals to participate in and give direction to social developments. The military in politics has a negative impact on the social policy. The empirical result shows that the military in politics does not have any impact on the health expenditure, but it reduces the education expenditure, and it is a reason for concern. The education expenditure has a positive effect on access to and attainment in schools (Gupta, Verhoeven, & Tiongson, 2002), and the previous literature has shown that the education and its attainment are important determinants of economic growth. Decreasing education expenditure would hinder the economic development. However, the democracy can be solution to the negative effect of the military in politics as the results for interaction effect between the military in politics and democracy are positive and statistically significant, meaning that it increases both education and health expenditure. It suggests that the democracy plays a significant role in promoting the social policy, especially in countries where the level of military in politics is high. Thus, policy measures that strengthen democratic procedures are desirable in the policy making process

Finally, it is crucial to implement policy and institutional measures aimed at

reducing corruption in order to prevent the distortion of composition of government expenditure and ensure the efficient management of government expenditure. Although there is corruption scandals repeatedly reported across the world, unlike the result from previous literature, the defense expenditure is lower in countries with high levels of corruption. It implies that the bureaucrats in countries with high levels of corruption are able to carry out their interests regardless of financial items, and more resources are allocated to economic affairs such as social overhead capital (SOC) (Shin, 2010). It does not mean that corruption is good, but it actually distorts the composition of government expenditure.

5. 2. Research Limitation

Despite the implications of this research, there are limitations of the study. Here, I present the future research direction as an alternative to overcome the limitation of research. First, there could be the measurement errors. The key variables, including the military in politics variable, used in this study are mainly used in academia. It is also the best data for the theoretical discussion of this study. However, there may be a bias of the experts when building the expert data and there may be a critical eye toward the country. Moreover, difficulties exist in collecting the national level data due to the inconsistency, unit of measure, culture and etc. The data used in this study is not a perfect, but it is the best alternative.

Second, there are issues with endogeneity. The causal relationships between the military in politics and expenditure of various policy areas may have a problem of endogeneity in the estimation model. Among the many reasons, the omitted variable, which is caused by omitting the variables correlated with the explanatory variables, may be raised as a problem. I attempted to overcome the issues through various

empirical analysis methods such as dynamic panel analysis, but there are still limitations. It is not easy find the instrument variable, but the efforts to find the appropriate instrument variable should be made in in the future.

Third, the analysis can be expanded to various policy areas. In this study, I focus on the defense, health, and education expenditures, but there are many important policy areas and government expenditure such as welfare, labor, SOC, research and development. Of course, in the case of cross-country analysis, it is difficult to collect data due to the difference in expenditure items and interpret the policy differences in detail. However, upon the data availability, I would expect to expand the analysis to various policy areas and expenditures.

Bibliography

Acemoglu, D., & Verdier, T. (1998). Property Rights, Corruption and the Allocation of Talent: A General Equilibrium Approach. *The Economic Journal*, 108(450), 1381-1403.

Adam, A. (2012). Military conscription as a means of stabilizing democratic regimes. *Public Choice, 150*(3), 715-730. doi:10.1007/s11127-010-9725-3

Agüero, F. (1995). *Soldiers, civilians, and democracy: Post-Franco Spain in comparative perspective*: Johns Hopkins University Press.

Aidt, T. S. (2009). Corruption, institutions, and economic development. *Oxford Review of Economic Policy, 25*(2), 271-291.

Albalate, D., Bel, G., & Elias, F. (2012). Institutional determinants of military spending. *Journal of Comparative Economics, 40*(2), 279-290.

Alt, J. E., & Lassen, D. D. (2006). Fiscal transparency, political parties, and debt in OECD countries. *European Economic Review, 50*(6), 1403-1439. doi:http://dx.doi.org/10.1016/j.euroecorev.2005.04.001

Apostolakis, B. E. (1992). Warfare-welfare expenditure substitutions in Latin America, 1953-87. *Journal of Peace Research, 29*(1), 85-98.

Arellano, M., & Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *The Review of Economic Studies, 58*(2), 277-297.

Bac, M. (2001). Corruption, connections and transparency: Does a better screen imply a better scene? *Public Choice, 107*(1-2), 87-96.

Ball, C. (2009). What is transparency? *Public Integrity, 11*(4), 293-308.

Ball, N. (1981). The military in politics: who benefits and how. *World*

Development, 9(6), 569-582.

Bardhan, P. (1997). Corruption and development: a review of issues. *Journal of economic literature, 35*(3), 1320-1346.

Barro, R. J. (1991). Economic growth in a cross section of countries. *The quarterly journal of economics, 106*(2), 407-443.

Bastida, F., & Benito, B. (2007). Central government budget practices and transparency: an international comparison. *Public Administration, 85*(3), 667-716.

Batchelor, P., Dunne, P., & Lamb, G. (2002). The demand for military spending in South Africa. *Journal of Peace Research, 39*(3), 339-354.

Baum, M. A., & Lake, D. A. (2003). The political economy of growth: democracy and human capital. *American Journal of Political Science, 47*(2), 333-347.

Ben-Meir, Y. (1995). *Civil-military relations in Israel*: Columbia University Press.

Benito, B., & Bastida, F. (2009). Budget transparency, fiscal performance, and political turnout: An international approach. *Public Administration Review, 69*(3), 403-417.

Bertot, J. C., Jaeger, P. T., & Grimes, J. M. (2010). Using ICTs to create a culture of transparency: E-government and social media as openness and anti-corruption tools for societies. *Government information quarterly, 27*(3), 264-271.

Bidani, B., & Ravallion, M. (1997). Decomposing social indicators using distributional data. *Journal of econometrics, 77*(1), 125-139.

Boix, C. (2003). *Democracy and redistribution*: Cambridge University Press.

Bove, V., & Cavatorta, E. (2012). From conscription to volunteers: Budget shares in NATO defence spending. *Defence and Peace Economics, 23*(3), 273-288.

doi:10.1080/10242694.2011.563973

Brecher, M. (1996). Introduction: crisis, conflict, war—state of the discipline. In: Sage Publications for the International Political Science Association.

Brodie, B. (1973). *War and politics*: Macmillan.

Brown, D. S., & Hunter, W. (1999). Democracy and social spending in Latin America, 1980–92. *American Political Science Review, 93*(4), 779-790.

Chambers, J. W. (1975). *Draftees Or Volunteers: A Documentary History of the Debate Over Military Conscription in the United States, 1787-1973*: Garland Pub.

Chu, K., Gupta, S., & Tanzi, V. (1999). *Economic Policy and Equity*: International Monetary Fund.

Collier, P., & Dollar, D. (2002). Aid allocation and poverty reduction. *European Economic Review, 46*(8), 1475-1500.

Collier, P., & Hoeffler, A. (2006). Military expenditure in post-conflict societies. *Economics of Governance, 7*(1), 89-107.

Collier, P., & Hoeffler, A. (2007). Unintended consequences: does aid promote arms races? *Oxford Bulletin of Economics and Statistics, 69*(1), 1-27.

Cooper, R. V. (1977). *Military manpower and the all-volunteer force*: Rand St. Monica Calif.

Cooray, A., Dzhumashev, R., & Schneider, F. (2017). How does corruption affect public debt? An empirical analysis. *World Development, 90*, 115-127.

D'Agostino, G., Dunne, J. P., & Pieroni, L. (2012). Corruption, military spending and growth. *Defence and Peace Economics, 23*(6), 591-604.

D'Agostino, G., Dunne, J. P., & Pieroni, L. (2016). Government spending, corruption and economic growth. *World Development, 84*, 190-205.

Dabelko, D., & McCormick, J. M. (1977). Opportunity costs of defense: some

cross-national evidence. *Journal of Peace Research, 14*(2), 145-154.

De Jong, J., & de Vries, M. S. (2007). Towards unlimited transparency? Morals and facts concerning leaking to the press by public officials in the Netherlands. *Public Administration and Development, 27*(3), 215-225.

Domke, W. K., Eichenberg, R. C., & Kelleher, C. M. (1983). The illusion of choice: Defense and welfare in advanced industrial democracies, 1948-1978. *American Political Science Review, 77*(1), 19-35.

Drabek, Z., & Payne, W. (2002). The impact of transparency on foreign direct investment. *Journal of Economic Integration*, 777-810.

Dudley, L., & Montmarquette, C. (1981). The demand for military expenditures: An international comparison. *Public Choice, 37*(1), 5-31. doi:10.1007/bf00124229

Dunne, J. P., Perlo-Freeman, S., & Smith, R. P. (2008). The demand for military expenditure in developing countries: hostility versus capability. *Defence and Peace Economics, 19*(4), 293-302.

Dunne, P., & Perlo-Freeman, S. (2003). The demand for military spending in developing countries. *International Review of Applied Economics, 17*(1), 23-48.

Dzhumashev, R. (2014). Corruption and growth: The role of governance, public spending, and economic development. *Economic Modelling, 37*, 202-215.

E Warren, M. (2004). What does corruption mean in a democracy? *American Journal of Political Science, 48*(2), 328-343.

Feaver, P. D. (1999). Civil-military relations. *Annual Review of Political Science, 2*(1), 211-241.

Filmer, D., & Pritchett, L. (1997). *Child mortality and public spending on health: how much does money matter?* (Vol. 1864): World Bank Publications.

Fisher, A. C. (1969). The Cost of the Draft and the Cost of Ending the Draft. *The*

American Economic Review, 59(3), 239-254.

Geraats, P. M. (2002). Central bank transparency. *The economic journal, 112*(483).

Goel, R. K., & Nelson, M. A. (1998). Corruption and government size: A disaggregated analysis. *Public Choice, 97*(1-2), 107-120.

Gonzalez, R. A., & Mehay, S. L. (1990). Publicness, scale, and spillover effects in defense spending. *Public Finance Quarterly, 18*(3), 273-290.

Gupta, S., De Mello, L., & Sharan, R. (2001). Corruption and military spending. *European Journal of Political Economy, 17*(4), 749-777.

Gupta, S., Verhoeven, M., & Tiongson, E. R. (2002). The effectiveness of government spending on education and health care in developing and transition economies. *European Journal of Political Economy, 18*(4), 717-737.

Hanushek, E. A., & Wößmann, L. (2007). *The role of education quality for economic growth*. The World Bank.

Harris, G., Kelly, M., & Pranowo. (1988). Trade-offs Between Defence and Education/Health Expenditures in Developing Countries. *Journal of Peace Research, 25*(2), 165-177.

Hausman, J. A. (1978). Specification tests in econometrics. *Econometrica: Journal of the Econometric Society*, 1251-1271.

Herspring, D. R. (1996). *Russian civil-military relations*: Indiana University Press.

Hessami, Z. (2014). Political corruption, public procurement, and budget composition: Theory and evidence from OECD countries. *European Journal of Political Economy, 34*, 372-389.

Hojman, D. E. (1996). Economic and other determinants of infant and child

mortality in small developing countries: the case of Central America and the Caribbean. *Applied Economics, 28*(3), 281-290.

Howell, L. D. (1998). *The handbook of country and political risk analysis*: PRS Group.

Howell, L. D. (2011). International country risk guide methodology. *East Syracuse, NY: PRS Group*.

Hsiao, C. (2007). Panel data analysis-advantages and challenges. *Test, 16*(1), 1-22.

Huntington, S. P. (1957). *The soldier and the state: The theory and politics of civil-military relations*: Harvard University Press.

Huntington, S. P. (1968). Modernization and corruption. *Political order in changing societies*, 59-71.

The Impact of Education. (2018). Retrieved from http://www.schoolsandhealth.org/Pages/education.aspx

Islam, R. (2003). *Do more transparent governments govern better?*. The World Bank.

Jehn, C., & Selden, Z. (2002). The end of conscription in Europe? *Contemporary Economic Policy, 20*(2), 93-100. doi:10.1093/cep/20.2.93

John Hongxin, Z., Kim, S. H., & Du, J. (2003). The impact of corruption and transparency on foreign direct investment: An empirical analysis. *Management International Review, 43*(1), 41-62.

Kim, K., & Moody, P. M. (1992). More resources better health? A cross-national perspective. *Social science & medicine, 34*(8), 837-842.

Kimenyi, M. S., & Mbaku, J. M. (1996). Rents, military elites, and political democracy. *European Journal of Political Economy, 11*(4), 699-708.

Kolstad, I., & Wiig, A. (2009). Is transparency the key to reducing corruption in resource-rich countries? *World Development, 37*(3), 521-532.

Kurtzman, J., Yago, G., & Phumiwasana, T. (2004). The global costs of opacity. *MIT Sloan Management Review, 46*(1), 38.

Lau, M. I., Poutvaara, P., & Wagener, A. (2004). Dynamic Costs of the Draft. *German Economic Review, 5*(4), 381-406. doi:10.1111/j.1465-6485.2004.00114.x

Leff, N. H. (1964). Economic development through bureaucratic corruption. *American behavioral scientist, 8*(3), 8-14.

Leys, C. (1965). What is the Problem about Corruption? *The Journal of Modern African Studies, 3*(2), 215-230.

Lindstedt, C., & Naurin, D. (2010). Transparency is not enough: Making transparency effective in reducing corruption. *International political science review, 31*(3), 301-322.

Linz, J. (1994). Democracia presidencialista o parlamentaria.¿ Qué diferencia implica? *LINZ, Juan y Arturo VALENZUELA (comps.): La crisis del presidencialismo, 1*.

Liu, C., & Mikesell, J. L. (2014). The impact of public officials' corruption on the size and allocation of US state spending. *Public Administration Review, 74*(3), 346-359.

Lui, F. T. (1985). An equilibrium queuing model of bribery. *Journal of Political Economy, 93*(4), 760-781.

Maizels, A., & Nissanke, M. K. (1986). The determinants of military expenditures in developing countries. *World Development, 14*(9), 1125-1140.

Majeed, M. T., & Macdonald, R. (2010). Corruption and the military in politics: theory and evidence from around the World.

Mauro, P. (1995). Corruption and growth. *The quarterly journal of economics, 110*(3), 681-712.

Mauro, M. P. (1996). *The Effects of Corruptionon Growth, Investment, and Government Expenditure* (No. 96-98). International Monetary Fund.

Mauro, P. (1998). Corruption and the composition of government expenditure. *Journal of Public economics, 69*(2), 263-279.

Mo, P. H. (2001). Corruption and economic growth. *Journal of Comparative Economics, 29*(1), 66-79.

Mulligan, C., & Shleifer, A. (2005). Conscription as Regulation. *American Law and Economics Review, 7*(1), 85-111.

Mulligan, C. B., Gil, R., & Sala-i-Martin, X. (2004). Do democracies have different public policies than nondemocracies? *The Journal of Economic Perspectives, 18*(1), 51-74.

Myrdal, G. (1968). Asian drama, an inquiry into the poverty of nations.

Nickell, S. (1981). Biases in dynamic models with fixed effects. *Econometrica: Journal of the Econometric Society*, 1417-1426.

Nikolaidou, E. (2008). The demand for military expenditure: Evidence from the EU15 (1961–2005). *Defence and Peace Economics, 19*(4), 273-292.

Nincic, M., & Cusack, T. R. (1979). The political economy of US military spending. *Journal of Peace Research, 16*(2), 101-115.

OECD. (2016). *Putting an End to Corruption*. Retrieved from https://www.oecd.org/corruption/putting-an-end-to-corruption.pdf

Olson, M., & Zeckhauser, R. (1966). An economic theory of alliances. *The review of economics and statistics*, 266-279.

Özsoy, O. (2008). Government budget deficits, defence expenditure and income

distribution: the case of Turkey. *Defence and Peace Economics, 19*(1), 61-75.

Pecorino, P. (1992). Rent seeking and growth: The case of growth through human capital accumulation. *Canadian Journal of Economics*, 944-956.

Perlo-Freeman, S. (2016, 3 August). Transparency and accountability in military spending. Retrieved from https://www.sipri.org/commentary/topical-backgrounder/2016/transparency-and-accountability-military-spending

Posen, B. R. (1984). The sources of military doctrine: France. *Britain, and Germany between the World Wars (Ithaca, NY: Cornell UP 1984)*.

Poutvaara, P., & Wagener, A. (2007). To draft or not to draft? Inefficiency, generational incidence, and political economy of military conscription. *European Journal of Political Economy, 23*(4), 975-987. doi: http://dx.doi.org/ 10.1016/j. ejpoleco.2006.12.001

Rahbek-Clemmensen, J., Archer, E. M., Barr, J., Belkin, A., Guerrero, M., Hall, C., & Swain, K. E. (2012). Conceptualizing the civil–military gap: A research note. *Armed Forces & Society, 38*(4), 669-678.

Richardson, L. F. (1960). Arms and Insecurity: A Mathematical Study of Causes and Origins of War. In: Boxwood Press.

Ross, M. (2006). Is democracy good for the poor? *American Journal of Political Science, 50*(4), 860-874.

Rothstein, B., & Eek, D. (2009). Political corruption and social trust: An experimental approach. *Rationality and society, 21*(1), 81-112.

Rothstein, B., & Teorell, J. (2008). What is quality of government? A theory of impartial government institutions. *Governance, 21*(2), 165-190.

Russett, B. (1982). Defense expenditures and national well-being. *American Political Science Review, 76*(4), 767-777.

Scheetz, T. (1992). The evolution of public sector expenditures: Changing political priorities in Argentina, Chile, Paraguay and Peru. *Journal of Peace Research, 29*(2), 175-190.

Schmidheiny, K., & Basel, U. (2011). Panel data: fixed and random effects. *Short Guides to Microeconometrics*, 2-7.

Sechser, T. S. (2004). Are soldiers less war-prone than statesmen? *Journal of Conflict Resolution, 48*(5), 746-774.

Seligson, M. A. (2002). The impact of corruption on regime legitimacy: A comparative study of four Latin American countries. *The Journal of Politics, 64*(2), 408-433.

Sen, A. K. (1998). *Economic policy and equity: an overview*: International Monetary Fund.

Setzekorn, E. (2014). Military Reform in Taiwan: The Lafayette Scandal, National Defense Law and All-Volunteer Force. *American Journal of Chinese Studies, 21*(1).

Smith, R. P. (1980). The demand for military expenditure. *The economic journal, 90*(360), 811-820.

Snyder, J. (1984). Civil-Military Relations and the Cult of the Offensive, 1914 and 1984. *International Security, 9*(1), 108-146.

Stasavage, D. (2003). Transparency, democratic accountability, and the economic consequences of monetary institutions. *American Journal of Political Science, 47*(3), 389-402.

Stasavage, D. (2005). Democracy and education spending in Africa. *American Journal of Political Science, 49*(2), 343-358.

Stepan, A. C. (1988). *Rethinking military politics: Brazil and the Southern Cone*:

Princeton University Press.

Stockemer, D., LaMontagne, B., & Scruggs, L. (2013). Bribes and ballots: The impact of corruption on voter turnout in democracies. *International political science review, 34*(1), 74-90.

Tanzi, V. (1998). Corruption around the world: Causes, consequences, scope, and cures. *Staff papers, 45*(4), 559-594.

Tarabar, D., & Hall, J. C. (2016). Explaining the worldwide decline in the length of mandatory military service, 1970–2010. *Public Choice, 168*(1), 55-74. doi:10.1007/s11127-016-0349-0

Thompson, E. A. (1979). An economic basis for the" national defense argument" for aiding certain industries. *Journal of Political Economy, 87*(1), 1-36.

Trybula, D. C. (1999). *Three essays on the economics of military manpower.* (9956943 Ph.D.), The University of Texas at Austin, Ann Arbor. ProQuest Dissertations & Theses Global database.

Warner, J. T., & Asch, B. J. (2001). The Record and Prospects of the All-Volunteer Military in the United States. *The Journal of Economic Perspectives, 15*(2), 169-192.

Welch, C. E. (1976). *Civilian control of the military: Theory and cases from developing countries*: SUNY Press.

Windmeijer, F. (2005). A finite sample correction for the variance of linear efficient two-step GMM estimators. *Journal of econometrics, 126*(1), 25-51.

Woo, J., & Kumar, M. S. (2015). Public debt and growth. *Economica, 82*(328), 705-739.

Yildirim, J., & Sezgin, S. (2005). Democracy and military expenditure: a cross-country evidence. *Transition Studies Review, 12*(1), 93-100.

Zhao, L., Zhao, L., & Chen, B.-F. (2015). The interrelationship between defence spending, public expenditures and economic growth: evidence from China. *Defence and Peace Economics*, 1-16.

국문 초록

정책결정요인이론과 민주주의 이론은 정책의 요인을 분석하고 검토하는 데 널리 사용된다. 정책결정요인이론은 정책을 종속변수로 보고 정책에 영향을 미치는 환경요인, 즉 정책의 내용을 결정하는 요인이 무엇인가를 밝혀내는 이론이다. 민주주의와 공공정책 이론은 민주국가와 독재국가에 따른 정책적 차이를 찾고 설명한다.

과거 연구에서는 민주주의 여부나 민주주의 수준 등 정치체제나 정당체제와 선거 등 정치제도적 설명변수를 통해 정책의 결정요인을 살펴보고 있으나, 다양한 정치 및 제도적 요인이 정책결정요인으로 고려될 필요가 있다. 따라서, 본 연구는 군의 정치참여 이론을 통해 국가간의 정책의 차이를 설명하고 정책결정요인으로써의 가능성을 탐색하고자 한다.

본 논문은 이론적 논의와 실증분석을 통해 1) 군의 정치 참여가 공공정책에 영향을 주는지, 2) 군의 정치 참여가 공공정책에 영향을 준다면 어떠한 영향을 주는지, 그리고 3) 정책결정과정에서 민주주의와 부패는 어떠한 역할을 하는지 살펴보았다. 이를 통해 정책결정과정에 대한 이해를 높이고, 바람직한 정책환경을 위한 정치체제 구조나 운영방식을 제고하고자 한다.

실증적 분석을 위해 International Country Risk Guide(ICGR), Polity IV, Stockholm International Peace Research Institute (SIPRI), International Institute for Strategic Studies (IISS), World Bank 등 다양

한 데이터 베이스를 사용하여 129 개국의 패널 데이터를 구성하였다. 또한, Pooled-OSL Model(최소자승추정), Random-effect Model(확률효과추정), Fixed-effect Model(고정효과추정), Dynamic Panel Data Model(동적패널 분석) 등 다양한 방법론을 활용하여 군의 정치참여와 다양한 정책간의 인과관계 추정을 시도하였다.

1장에서는 민-군 관계의 이론적 논의를 통해 군의 정치참여에 대한 개념을 설정하였다. 군의 정치참여와 국방정책에 관한 이론을 구성하여 군의 정치참여가 국방정책에 어떻게 영향을 주는지 살펴보았으며, 실증적 분석을 통해 군의 정치참여와 국방정책간의 관계에 대한 경험적 증거를 제시하였다. 실증분석 결과, 군의 정치참여가 높은 국가에서 GDP 대비 국방비 비율과 정부지출 대비 국방부 비율이 증가하는 것으로 나타났다. 그리고 군의 정치참여가 높은 국가에서 모병제도를 유지하는 경향이 높은 것으로 분석되었다.

2장에서는 교육과 보건 지출을 대리변수로 활용하여 군의 정치참여 수준에 따라 국가간 사회 정책에 차이가 나타나는지를 분석하였다. 또한 군의 정치참여와 민주주의 간의 상호작용분석을 통해 민주주의 역할을 고찰하였다. 실증분석 결과는 군의 정치참여가 교육 지출을 유의미하게 감소시키는 것으로 나타나고 있지만, 군의 정치참여와 보건지출과의 관계는 통계적으로 유의미하지 않았다. 상호작용 분석결과 민주주의가 군의 정치참여에 따른 교육과 보건지출 감소를 줄이는데 중요한 역할을 한다는 것을 밝히고 있다.

마지막으로, 3장에서는 군의 정치참여를 고려한 국가의 부패와 국방

지출의 관계를 분석하였다. 국가 자원의 효율적인 활용 측면에서 부패가 매우 중요하지만, 부패와 국방지출에 관한 연구는 미비하다. 부패는 국방지출과 부의 관계를 가지고 있는 것으로 나타났다. 즉, 군의 정치참여 수준이 같은 국가에서 부패가 높을 수록 국방지출이 감소하는 경향을 보이고 있다.

정부 지출정책은 다양한 요인에 의해 결정된다. 바람직한 정책을 위해서 정책환경이 정책을 미치는 영향을 이해하는 것이 매우 중요하다. 이에 본 연구는 기존 민주주의와 공공정책 이론이 다루고 있지 않는 요인인 군의 정치참여와 공공정책 대한 인과관계를 이론적으로 구성하여, 정치참여가 정책결정요인으로써 어떠한 역할을 하는지 살펴보았다. 군의 정치참여에 대한 이론적 틀로, 군의 정치참여와 국방예산, 병역제도, 교육예산, 보건예산, 부패 등 다양한 정책적 요소와의 관계를 실증적으로 규명하였다. 그리고 사회적 안전장치로 민주주의 역할을 재조명하였다.

주요어 : 군 정치참여, 정책결정론, 국방정책, 정부예산, 부패, 민주주의

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