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ลิขสิทธิ์ของจุฬาลงกรณ์มหาวิทยาลัย

The Arms Trade, Wars, Military Expenditure and Economic Growth  
in the United States and Related Countries

Miss Kamonnat Meetaworn



A Dissertation Submitted in Partial Fulfillment of the Requirements  
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By	Miss Kamonnat Meetaworn
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กมลนัทร มีถาวร : การค้าอาวุธสงคราม สงคราม ค่าใช้จ่ายทางทหาร และการเติบโตทางเศรษฐกิจของประเทศสหรัฐอเมริกาและประเทศที่เกี่ยวข้อง (The Arms Trade, Wars, Military Expenditure and Economic Growth in the United States and Related Countries) อ.ที่ปริกษาวิทยานิพนธ์หลัก: ศ. ดร.อิศรา ศานติศาสตร์, 193 หน้า.

วิทยานิพนธ์ฉบับนี้มีวัตถุประสงค์เพื่อ 1) วิเคราะห์ความสัมพันธ์ระหว่างการค้าอาวุธสงคราม การเข้าร่วมสงคราม ค่าใช้จ่ายทางทหาร และภาวะเศรษฐกิจของประเทศผู้ส่งออกอาวุธสงคราม 2) วิเคราะห์ผลกระทบระหว่างกันของค่าใช้จ่ายทางทหารและการเติบโตทางเศรษฐกิจใน 3 กลุ่มประเทศ ซึ่งได้แก่ กลุ่มประเทศผู้นำเข้าอาวุธสงครามและน้ำมัน กลุ่มประเทศผู้ส่งออกน้ำมัน ผู้นำเข้าอาวุธสงคราม และกลุ่มประเทศผู้ส่งออกอาวุธสงคราม 3) ศึกษาบทบาทของสหรัฐอเมริกาในสงครามทั่วโลก และ 4) วิเคราะห์ความสัมพันธ์ระหว่างการเข้าร่วมสงครามใหญ่กับภาวะเศรษฐกิจของประเทศมหาอำนาจทางทหาร ทำการศึกษาโดยใช้วิธีการวิเคราะห์เชิงคุณภาพและเชิงปริมาณ และใช้ข้อมูลทุติยภูมิระหว่างปี ค.ศ. 1989 – 2013 ซึ่งรวบรวมมาจากแหล่งข้อมูลต่างๆ

ผลจากการศึกษา พบว่าประเทศผู้ส่งออกอาวุธสงครามที่มีค่าใช้จ่ายทางทหารยังสูงยิ่งเข้าร่วมสงครามบ่อย นอกจากนี้พบว่ามูลค่าของค่าใช้จ่ายทางทหารมีความสัมพันธ์ทางบวกกับมูลค่าการส่งออกอาวุธสงคราม ในขณะที่เดียวกันพบว่าความถี่ของการเข้าร่วมสงครามมีความสัมพันธ์ทางบวกกับมูลค่าการส่งออกอาวุธสงคราม นอกเหนือจากนี้ยังพบว่าประเทศผู้ส่งออกอาวุธสงครามเข้าร่วมสงครามเป็นประจำไม่ว่าประเทศนั้นจะกำลังประสบปัญหาทางเศรษฐกิจหรือไม่ก็ตาม

สำหรับกลุ่มประเทศผู้นำเข้าอาวุธและน้ำมัน พบว่าสัดส่วนของค่าใช้จ่ายทางทหารกับการเติบโตทางเศรษฐกิจไม่มีความสัมพันธ์กันอย่างมีนัยสำคัญทางสถิติ ทั้งนี้ อาจเนื่องมาจากกองกำลังทางทหารในกลุ่มประเทศนี้ให้บริการทั้งด้านการทหารและที่ไม่ใช่ด้านการทหาร ส่งผลให้ผลกระทบทางลบของค่าใช้จ่ายทางทหารลดลง ในขณะที่สัดส่วนของค่าใช้จ่ายทางทหารส่งผลกระทบต่อการเติบโตทางเศรษฐกิจของประเทศผู้ส่งออกน้ำมัน ผู้นำเข้าอาวุธสงคราม อย่างมีนัยสำคัญทางสถิติ ความสัมพันธ์ดังกล่าวเป็นผลมาจากการเกิด crowding-out effects ของค่าใช้จ่ายทางทหารในทางกลับกันพบว่าสัดส่วนของค่าใช้จ่ายทางทหารส่งผลกระทบต่อการเติบโตทางเศรษฐกิจในประเทศผู้ส่งออกอาวุธสงครามอย่างมีนัยสำคัญทางสถิติ โดยผลกระทบดังกล่าวเป็นผลมาจากอุปสงค์ที่เพิ่มขึ้นจากการใช้จ่ายทางทหาร เพราะมีการจ้างงานมากขึ้นในอุตสาหกรรมอาวุธสงคราม นอกจากนี้การใช้จ่ายเพื่อการวิจัยและพัฒนาในอุตสาหกรรมอาวุธสงครามยังอาจก่อให้เกิดผลกระทบทางบวกด้านอุปทานด้วย นอกเหนือจากการเพิ่มค่าใช้จ่ายทางทหารยังอาจส่งผลให้ประชาชนมีความเชื่อมั่นด้านความมั่นคงของประเทศและความปลอดภัยในชีวิตและทรัพย์สินมากขึ้น จนกระทั่งมีแรงจูงใจในการผลิตสินค้าและบริการเพิ่มขึ้น

สหรัฐอเมริกามีบทบาทสำคัญในสงครามทั่วโลก โดยสหรัฐอเมริกาทำสงครามในประเทศต่างๆ เกือบทุกปี นับตั้งแต่ปี ค.ศ. 1946 เป็นต้นมา และมีอุตสาหกรรมอาวุธสงครามเป็นอุตสาหกรรมที่สำคัญของประเทศ จากการวิเคราะห์ข้อมูลระหว่างปี ค.ศ. 1960 – 2010 ของสหรัฐอเมริกาและประเทศมหาอำนาจทางทหารอื่นๆ อีก 5 ประเทศ พบว่าการเข้าร่วมสงครามใหญ่กับภาวะเศรษฐกิจของประเทศมหาอำนาจทางทหารมีความสัมพันธ์กันในทิศทางตรงกันข้ามอย่างมีนัยสำคัญทางสถิติ นอกจากนี้พบว่าจำนวนสงครามย่อยที่ประเทศมหาอำนาจทางทหารเข้าร่วมมีความสัมพันธ์ในทิศทางตรงกันข้ามกับการเข้าร่วมสงครามใหญ่อย่างมีนัยสำคัญทางสถิติ

สาขาวิชา เศรษฐศาสตร์

ปีการศึกษา 2558

ลายมือชื่อ นิสิต .....

ลายมือชื่อ อ.ที่ปรึกษาหลัก .....

# # 5385901129 : MAJOR ECONOMICS

KEYWORDS: ARMS TRADE, WARS, MILITARY EXPENDITURE, MILITARY SPENDING, ECONOMIC GROWTH

KAMONNAT MEETAWORN: The Arms Trade, Wars, Military Expenditure and Economic Growth in the United States and Related Countries. ADVISOR: PROF. ISRA SARNTISART, Ph.D., 193 pp.

The aims of this thesis are 1) to examine the relationship between the arms trade, war participation, military expenditure, and the economic situation in arms exporting countries, 2) to investigate the feedback on military expenditure and economic growth in three different groups of countries: arms and oil importing countries, oil exporting but arms importing countries, and arms exporting countries, 3) to study the roles of the United States in global wars, and 4) to analyze the relationship between participation in major wars and the economic situation in military superpower countries. Both qualitative and quantitative analysis methods are employed to analyze the secondary data from between 1989 and 2013 that are obtained from various sources.

The study result reveals that arms exporting countries with higher military expenditure participate in wars more frequently. Furthermore, it is found that the volume of military expenditure is positively related to the volume of arms transfers. Moreover, the frequency of war participation of arms exporting countries has a positive relationship with the volume of arms transfers. Furthermore, it is likely that arms exporting countries participate in wars in foreign countries whether they are encountering economic sluggishness or not.

The result of this thesis indicates that for arms and oil importing countries, the relationship between the share of military expenditure and economic growth is insignificantly negative. Perhaps, because the military sector of these countries brings about some economic benefits by providing both military and non-military services for the civilian sector; therefore the negative impacts of military expenditure on GDP growth are reduced. On the other hand, the results show that the share of military expenditure has a significantly negative effect on economic growth in oil exporting but arms importing countries. This result indicates the crowding-out effects of military expenditure. In contrast, the share of military expenditure has a significantly positive effect on economic growth in arms exporting countries. The result indicates the demand side effects of military expenditure on increases in resource employment in defense industries. Furthermore, increases in R&D in defense industries might contribute to supply side effects. Moreover, military expenditure might affect economic growth through security channels.

The United States has an important role in global wars. The defense industry is an important industry in the United States. In addition, since 1946 it has undertaken military intervention in foreign countries in almost every year. Using panel data during the time period 1960 to 2010 on the United States and five other military superpower countries, it is found that economic growth in military superpower countries has a significantly negative relationship with the start of participation in a major war. Additionally, it is found that the number of minor war engagements has a significantly negative relationship with the start of participation in a major war by the military superpower countries.

Field of Study: Economics  
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Student's Signature .....

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## **Chapter 1**

### **Introduction**

#### **1.1 Motivation**

From 1989 to 2012 worldwide, there were 856,814 battle-related deaths (World Bank, 2014). Apart from that, war is the main cause of a vast number of refugees in many countries. In 2013, the size of the refugee population was 11,703,179 persons (United Nations High Commissioner for Refugees, 2014). Besides, wars cause economic stagnation. They destroy the power of countries to produce as well as demand products and services (Attar, 2009). Human capital is redirected to the battlefield rather than being used in economic production. Furthermore, they negatively affect the domestic economy through a decrease in private investment (Weinstein and Imai, 2000). They also brought about destruction of infrastructure and ancient monuments in many places in the world. Moreover, wars have a relationship with terrorism. The linkage between wars in the Middle East and 9/11 situation is an obvious example of this relationship.

Nonetheless, numerous arms from arms exporting countries have been transferred to fuel wars. Troops from these countries have engaged in wars in foreign countries. Many countries spend a large amount of money on military expenditure. These facts raise the argument that while there are numerous sufferers, some people benefit from wars, the arms trade, and military expenditure. Hence, this thesis attempts to reveal the linkage of wars, the arms trade, military expenditure and the benefits or losses of stakeholders like arms and oil importing countries, oil exporting but arms importing countries, and arms exporting countries. This thesis focuses on the role of the United States in global wars because the United States is the largest arms exporting country and occupies the largest share of world military expenditure.

This thesis is organized as follows. Chapter 1 is the introduction. Chapter 2 provides information about the arms trade, global wars, and military expenditure. The relationship between the arms trade, wars and military expenditure is also portrayed. Chapter 3 presents the analysis of the relationship between military spending and

economic growth in three groups of countries; arms and oil importing countries, oil exporting but arms importing countries, and arms exporting countries. Chapter 4 contains two parts. The first part is a presentation of the US defense industry, military intervention in foreign countries, and the relations between the United States and key allies. The second part presents an analysis of the relationship between participation in major wars and the economic situation in military superpower countries. Chapter 5 summarizes the results of the study.

## **1.2 Objectives**

The aims of this thesis are as follows:

- 1) To examine the relationship between the arms trade, war participation, military expenditure, and the economic situation in arms exporting countries.
- 2) To investigate the feedback on military expenditure and economic growth in three different groups of countries; arms and oil importing countries, oil exporting but arms importing countries, and arms exporting countries.
- 3) To study the roles of the United States in global wars.
- 4) To analyze the relationship between participation in major wars and the economic situation in military superpower countries.

## **1.3 Scope of the study**

Data between 1989 and 2013 are obtained to investigate the relationship between the arms trade, military expenditure, and war participation of arms exporting countries. Also these data are used to examine the relationship between military expenditure and economic growth in arms and oil importing countries, oil exporting but arms importing countries, and arms exporting countries. Besides, data from 1960 to 2010 are used to study

the relationship between participation in major wars and economic situation in military superpower countries.

#### **1.4 Contribution of the study**

The contribution of the study is to help public be aware of the causes of wars, as well as the impacts of war and military expenditure on economic growth. This study attempts to give useful guidance for authorized persons to allocate the military of military expenditure in GDP properly. In other words, this study provides insights for authorized persons to decide whether to support or oppose wars. In addition, this study attempts to send a warning signal about major wars.

#### **1.5 Methodology**

##### **1.5.1 Data**

This thesis uses secondary data obtained from various sources;

1) Nominal Gross Domestic Product, the inflation rate, the share of government expenditure, the share of investment, and number of population are obtained from the International Monetary Fund (IMF) (2014).

2) The list of arms recipient countries, the list of arms exporting countries, the share of military expenditure, and arms transfers are obtained from the Stockholm-International-Peace-Research-Institute (2012) (SIPRI) ( 2014a; 2014b; 2014d; 2014c).

3) Chapter 2 and chapter 3 employ the share of military expenditure obtained from the Stockholm International Peace Research Institute (2014c). Whereas the military expenditure of the United States employed in chapter 4 is obtained from the Office of the Under Secretary of Defense (Cordesman, 2015).



While SIPRI provides a dataset of the share of military expenditure of all countries from 1988 to the present, the Office of the Under Secretary of Defense provides only the datasets of the United States from 1950 to 2016 and the projection of US military expenditure from 2017 to 2020. Since chapter 2 and chapter 3 aim to analyze military expenditure and its effect for all countries from the end of the Cold War to 2013, these chapters obtain data from SIPRI. Chapter 4, however, focuses on analyzing the impact of military expenditure of the United States. This chapter, therefore, uses the longer period data provided by the Office of the Under Secretary of Defense.

4) The list of wars is obtained from Uppsala Universitet (2014), Grossman (2012), Global Policy Forum (2005), World Statemen.org (n.d.), and Washington's blog (2015).

It should be noted that the Ucdp/Prio Armed Conflict Dataset of Uppsala Universitet is one of the most well-known in regard to global armed conflicts. The definition of armed conflict here is the conflict that causes at least 25 battle-related deaths. This definition includes both interstate and intrastate armed conflicts. This database provides information about wars since the 1970s up to the present.

The Correlates of War Project (COW) is another well-known data source. The differences between the datasets of COW and Uppsala Universitet are the definitions of war and data availability. A threshold of 1,000 battle-related deaths as the level of hostilities differentiates war from other types of conflict. This database provides information about wars between 1816 and 2010.

This thesis is interested in wars from 1989 to 2013, therefore uses the data provided by the Uppsala Universitet.

Grossman (2012) is one of the sources cited in this thesis. Dr. Zoltan Grossman is a faculty member of Geography/Native American Studies, the Evergreen State College, Olympia Washington. His expertise is about geography and Native American studies. He collected data from various sources; news reports, the *Congressional Record* (23 June 1969), a book titled "*One Hundred Eighty Landings of United States Marines 1800-1934*"

by History and Museums Division Headquarters, U.S. Marine Corps Washington, D.C. 1974, an article "*U.S. Nuclear Threats: A Documentary History*" by Ege and Makhijani published in *Counterspy* in July-Aug 1982, a report "*Instances of Use of United States Forces Abroad, 1798-1993*" by Ellen C. Collier and published by Library of Congress in October 7, 1993, and a book "*Stop Nuclear War "Protest and Survive: An Appeal to Americans"*" introduced by an independent social magazine named "Monthly Review".

This thesis also uses data from the Global Policy Forum, an independent organization watching the work of the United Nations and scrutinizes global policymaking. It is a non-profit organization with consultative status at the UN. It has offices both in the United States and in Germany.

Other sources of data are Washington's Blog and World Statemen.org. Washington's Blog is an active website that plays as a news reporter. World Statemen.org is another source used in this thesis. According to the National Library of Australia, World Statemen.org is an online encyclopedia that provides information about lists of flags, maps, leaders, chronologies, and national anthems, to give a portrait of polities past and present. This thesis finds data from these sources. The data obtained from these sources are crosschecked with Uppsala Universitet (2014), and Grossman (2012).

5) Chapter 2 and chapter 3 use GDP growth calculated by the author using the World Economic Outlook Database of the IMF (2014), while the GDP growth of the military superpower countries in chapter 4 is obtained from the World Bank (2015a).

The IMF provides datasets from 1980 to the present. Since chapter 2 and chapter 3 aim to analyze GDP growth and its effect from the end of the Cold War to 2013, the author obtains data from the IMF.

Chapter 4 aims to analyze the GDP growth of the United States and other military superpower countries. IMF provides data only from 1980 to the present. The author, therefore, obtains data from the World Development Indicators of the World Bank because this source provides a longer period of datasets, from 1960 to the present.

6) The list of oil exporting countries is obtained from the Association for the Study of Peak Oil & Gas USA (n.d.).

7) The location of each country in chapter 2 is identified by the World Factbook of the Central Intelligence Agency (CIA) (n.d.).

### **1.5.2 Analysis**

This thesis employs both qualitative and quantitative analysis. For the qualitative analysis, descriptive statistics are used to describe the arms trade, military expenditure, and the frequency of participation in war. Furthermore, it is used to evaluate the relationship between participation in war and economic situation in arms exporting countries, the importance of the US defense industry, and the relationship between the United States and its key allies.

For the quantitative analysis, a simple regression method is employed to examine the relationships between arms exports, military expenditure, and the frequency of participation in war. Besides, panel VAR models are obtained to investigate the relationship between military expenditure and economic growth. The panel VAR models are extended time series VAR models. Both static and dynamic interdependencies can be captured by these models. They treat the links across series in an unrestricted fashion. Using VAR models, time variations in the coefficients and the variance of the shocks are incorporated. Additionally, they justify cross sectional dynamic heterogeneities.

In addition, a panel logistic model is employed to analyze the relationship between participation in major wars and economic situation in military superpower countries. The panel logistic model is an extended logistic model. It is a categorical dependent variable model which the dependent variable is categorical. The model used in this thesis is a panel binary logistic model. The dependent variable is 1 if the military superpower country started to participate in a major war; the dependent variable is 0 otherwise.

## 1.6 Definition

Arms, in this thesis, mean conventional weapons defined by SIPRI such as tanks, planes, etc., and exclude small weapons and chemical weapons.

It should be noted that two main sources have been popularly used in the analysis of the arms trade (Garcia-Alonso and Levine, 2007). The first source is SIPRI, which provides yearly data on the volume of transfers of conventional arms, not including transfers of small arms and chemical weapons. It is a volume measure because quantities are multiplied by Trend Indicator Values, not the prices actually paid. The second source is World Military Expenditure and the Arms Trade (WMEAT), which provides the value of transfers, therefore taking account of the prices actually paid, and includes small arms. WMEAT's data reports were discontinued in 2003. However, the reports from the US Congressional Research Service (CRS) can be used as a substitute. These reports offer up-to-date data on arms transfers to developing countries in terms of value. While the CRS report gives separate data on arms transfer agreements and arms transfer deliveries, SIPRI focuses on arms transfer deliveries.

This thesis would like to see the impacts of conventional arms or major weapons systems. Furthermore, this thesis focuses on the volume of transfers of conventional arms which includes both in kind and in money values. Therefore the data from SIPRI are used in the analysis. Thus, in this thesis, arms mean conventional weapons such as tanks, planes, etc., and excludes small weapons and chemical weapons.

The arms trade means arms transfers. The volume of arms transfers is calculated by multiplying the quantity of transferred arms and Trend Indicator Values (TIVs). This volume includes both in kind and in money transferred arms, not only the volume of actual paid arms.

Defense corporation means arms producers and other military producers in the defense industry. The defense industry includes arms producers and other military

related producers. A military related producer is a producer that produces products or services to supply arms producers or military providers.

According to the Oxford Advanced Learner's Dictionary 6<sup>th</sup> edition, the definition of defense is the act of protecting somebody or something from attack, criticism, etc. Another definition is something that provides protection against attack from enemies, the weather, illness, etc. However, in this thesis, the defense industries in arms exporting countries influence wars in arms importing countries for profit. Therefore, these industries should not be called "defense industries". They should be named "military industries". Nonetheless, this thesis adopts the term "defense industry" to represent "military industry".

War or armed conflict, defined by Uppsala Conflict Data Program (UCDP) of Uppsala Universitet, is a fight that concerns the usurpation of power or the right to rule over the territory between armed forces of two parties, of which at least one side is the government of a state, and results in at least 25 battle-related deaths per year. In this context, the meaning of war covers uprisings and rebellions. The definition of major war and minor war are defined in part 4.7 of chapter 4.

War engagement or participation in war means the war participation that is officially declared by the participants.

Military intervention means the deployment of military forces to a foreign country. It should be noted that military deployment may occur both during a war period and in no war periods.

Nation-state means the country with more or less fixed boundaries. Each frontier has been arranged whereby some people can cross with ease, others with difficulty and others still not at all. This has been the case since the system began. It has been completed as a result of decolonization after 1945 and the disintegration of the Soviet Union after 1989. Now it is fully legitimated by the United Nations (Stander, 2010).

## **Chapter 2**

### **The Arms Trade, Wars, and Military Expenditure**

#### **2.1 Introduction**

The aims of this chapter are 1) to provide facts about the arms trade, global wars, and military expenditure, and 2) to examine the relationship between the arms trade, the frequency of war participation, military expenditure, and the economic situation in arms exporting countries. This chapter consists of eight parts. The first part is the introduction. The second part is the limitations. The third part describes the methodology. The fourth part provides facts about the arms trade. The fifth part focuses on global wars. The sixth part provides information about military expenditure. The seventh part presents the empirical results with regard to the relationship between the arms trade, the frequency of war participation, military expenditure, and the economic situation in arms exporting countries. The eighth part is a summary.

#### **2.2 Limitations**

1) The main objective of this chapter is to study the relationship between the frequency of war participation and the arms transfers of arms exporting countries. However, the author cannot determine the total number of war participations. In this thesis, war participation includes only official war engagements. Furthermore, war in this thesis includes only conflicts involving the usurping of power or the right to rule over territory using the armed forces of two parties, of which at least one is the government of a state, and results in at least 25 battle-related deaths per year. It neither includes conflicts that result in less than 25 battle-related deaths per year, nor conflicts between two parties in which neither is the government of a state.

2) The volume of arms transfers is calculated by multiplying the quantity of transferred arms and the Trend Indicator Values (TIVs). This volume includes both in kind and in money transferred arms, not only the volume of actual paid arms. However, this

volume excludes arms deals in the black and gray markets. In addition, arms in this thesis include only conventional weapons such as tanks, planes, etc. They exclude small weapons, chemical weapons, and nuclear weapons.

### **2.3 Methodology**

This chapter uses secondary data obtained from various sources. Nominal Gross Domestic Product, the inflation rate, and the share of government expenditure are obtained from the IMF (2014). The location of each country is identified by the World Factbook of the Central Intelligence Agency (n.d.). The list of oil exporting countries is obtained from the Association for the Study of Peak Oil & Gas USA (n.d.). The list of ASEAN countries is obtained from the Association of Southeast Asian Nations (n.d.). Arms transfers, the list of arms exporting countries, and the share of military expenditure are obtained from SIPRI (2014a; 2014b; 2014c). The list of war participation is obtained from Uppsala Universitet (2014).

Uppsala Universitet is a university in Sweden that has recorded armed conflicts since the 1970s up to the present. The data provided by the Uppsala Universitet are well-known with regard to armed conflicts. The definition of armed conflict is conflict that causes at least 25 battle-related deaths per year. This definition includes both interstate and intrastate armed conflicts.

Descriptive statistics are obtained to describe situations and trends of world arms transfers between 1950 and 2013, global wars between 1989 and 2013, and world military expenditure between 1989 and 2013. Data from 1989 to 2013 of arms exporting countries are then used to analyze the relationship between arms exports, military expenditure, and war participation using the simple regression method. A qualitative method is then employed to examine the relationship between war participation and the economic situation in arms exporting countries.

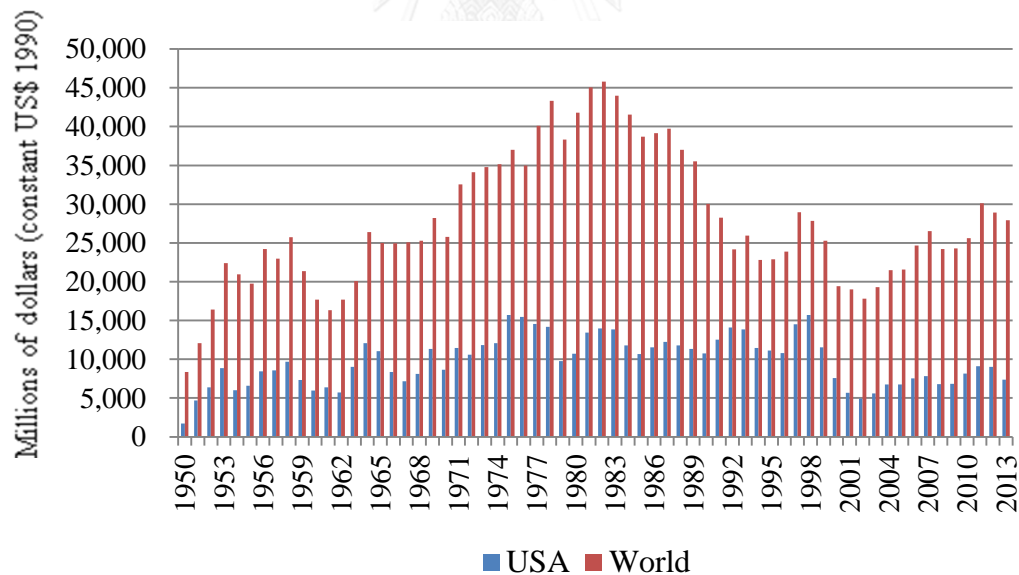
## 2.4 The arms trade

This part explores information about the arms trade. However, since this thesis uses the volume of both in kind and in money transferred arms reported by SIPRI, not only the volume of actually paid arms, the term “arms transfers” is used instead of “arms trade”. This part is divided into two subparts. The first subpart describes world arms transfers and the second explains the arms transfers in ASEAN countries.

### 2.4.1 World arms transfers

The world market for arms is large. Enormous quantities of arms are transferred to fuel wars around the globe. However, the trend of world arms transfer volume between 1950 and 2013 fluctuated over the period (Figure 1).

Figure 1 World arms transfer volume, 1950 – 2013 (in constant 1990 US\$ million, SIPRI trend-indicator value)



Source: Stockholm International Peace Research Institute (2014a).

The increase in arms transfers from 1950 until 1982 was due to an increase in the threat of war, the Cold War in particular (Garcia-Alonso and Levine, 2007). After 1982, global arms transfers shrunk because of economic turmoil and the end of the Cold War. Oil price shocks due to the outbreak of the Iraq-Iran war induced economic recession. This



situation affected the global arms transfers in the subsequent years. Governments procured fewer armaments. It can be seen from this situation that armed conflict that involved many powerful countries might lead to economic decline in subsequent years, and ultimately might cause a decline in demand for conventional arms in those years.

Furthermore, the decline of arms transfers during the 1990s and the early 2000s was due to the end of the Cold War. The collapse of the Soviet Union meant that Russia discontinued supplying weapons to its allies for free or on easy credit. The trend of arms transfers in 1997-1999 increased from 1996 due to the demand for arms in Asian countries, Taiwan, Turkey, South Korea, China and India. After that, the trend dropped again because of the global economic decline in the new century. An increase between 2003 and 2010 was mainly driven by the demand for arms by India, China, South Korea, Greece and the UAE.

Over the time period from 1989 to 2013, there were 28 arms exporting countries (Stockholm International Peace Research Institute, 2014b). Arms transfers from 19 economically developed countries; Belgium, Canada, Denmark, Finland, France, Germany, Israel, Italy, Netherlands, Norway, Poland, Russia, South Africa, South Korea, Spain, Sweden, Switzerland, the United Kingdom, and the United States, and 8 developing countries; Belarus, Brazil, China, Czechoslovakia, Czech Republic, North Korea, Ukraine, and Uzbekistan, was US\$ 623,221 million (Trend Indicator Values, in constant 1990 US\$). Of these, the United States was the world's largest arms exporting country. It dominated the global arms market. Between 1989 and 2013, the amount of US arms transfers was 37.88% of all arms transfers in this period (Table 1).

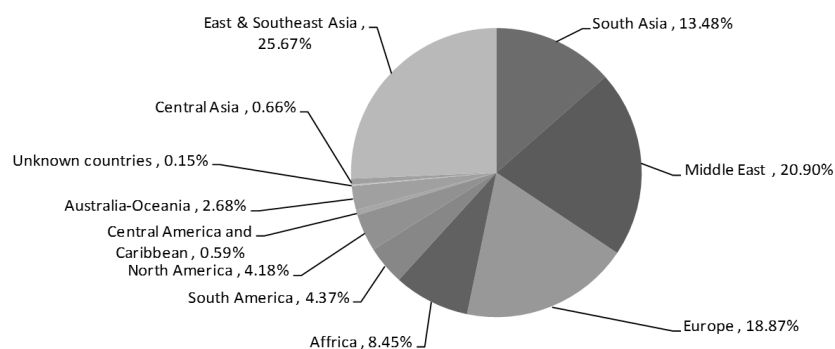
Most of the transferred arms between 1989 and 2013 were delivered to developing regions (Figure 2). 61.71 % of the transferred arms were transferred to Asian countries whereas the arms transfers to the Middle East accounted for 20.90 % of the total. Europe imported 18.87 % of all transfers. India and China had the largest and the second largest share of arms, respectively, in terms of import value between 1989 and 2013. The market shares of India and China were 8.35% and 6.28%, respectively (Table 2).

Table 1 Arms transfers by country, 1989-2013, (TIVs) expressed in US\$ million at constant (1990) prices

No.	Arms Exporting Country	Arms Exports							Total	Share
		1989	1990-1944	1995-1999	2000-2004	2005-2009	2010-2013			
1	United States	11,326	62,702	64,048	30,398	35,383	32,206	236,062	37.88%	
2	USSR/Russia	12,537	23,449	16,733	27,128	27,336	31,131	138,314	22.19%	
3	Germany (FRG)	1,347	10,150	8,095	6,347	13,032	6,232	45,203	7.25%	
4	France	2,213	5,689	11,071	7,816	9,988	5,232	42,011	6.74%	
5	United Kingdom	3,521	7,563	8,288	6,094	5,044	4,494	35,006	5.62%	
6	China	1,046	5,539	2,913	2,411	3,064	6,302	21,274	3.41%	
7	Netherlands	556	2,307	2,474	1,275	3,836	1,989	12,438	2.00%	
8	Italy	335	1,334	1,997	1,516	2,944	2,997	11,123	1.78%	
9	Ukraine		486	2,482	1,622	2,216	3,122	9,925	1.59%	
10	Israel	212	1,240	1,116	2,385	2,342	2,451	9,747	1.56%	
11	Sweden	412	824	1,352	2,276	2,165	2,359	9,388	1.51%	
12	Spain	174	607	1,025	217	3,109	3,025	8,157	1.31%	
13	Switzerland	261	1,549	925	967	1,512	984	6,201	0.99%	
14	Canada	49	663	636	912	1,203	1,019	4,479	0.72%	
15	South Korea (ROK)	48	257	223	407	990	1,053	2,976	0.48%	
16	Belarus		8	1,031	484	371	693	2,586	0.41%	
17	Czechoslovakia	1,050	1,228	0	0	0	0	2,278	0.37%	
18	Norway	124	439	52	278	351	537	1,781	0.29%	
19	Poland	20	347	308	310	611	177	1,774	0.28%	
20	South Africa	0	194	106	189	582	563	1,632	0.26%	
21	Belgium	36	35	411	162	684	193	1,520	0.24%	
22	Czech Republic		426	341	290	207	31	1,294	0.21%	
23	North Korea (DPRK)	14	409	271	474	100	0	1,264	0.20%	
24	Brazil	47	391	95	72	227	251	1,083	0.17%	
25	Denmark		652	15	266	46	62	1,039	0.17%	
26	Finland		68	107	157	389	295	1,014	0.16%	
27	Uzbekistan		0	0	378	213	418	1,009	0.16%	
28	German Democratic Republic	149	77	0	0	0	0	226	0.04%	
	Total	35,914	131,648	128,580	96,678	120,759	109,641	623,221	100.00%	

Source: Stockholm International Peace Research Institute (2014b).

Figure 2 Percentage share of arms importing of conventional weapons, by region: 1989-2013



Source: Stockholm International Peace Research Institute (2014a).

Table 2 Arms imports by country, 1989-2013, (TIVs) expressed in US\$ m. at constant (1990) prices

No.	Arms Importing Country	Arms Imports							Total	Share
		1989	1990-1994	1995-1999	2000-2004	2005-2009	2010-2013			
1	India	4,005	7,720	5,916	9,131	8,675	16,568	52,015	8.35%	
2	China	111	3,190	5,207	13,976	11,540	5,128	39,153	6.28%	
3	South Korea (ROK)	1,842	4,940	8,282	4,503	6,595	3,938	30,097	4.83%	
4	Turkey	1,007	8,500	9,024	3,136	3,677	3,243	28,586	4.59%	
5	Saudi Arabia	1,415	7,675	10,109	2,050	1,620	4,498	27,363	4.39%	
6	Japan	2,179	11,166	5,530	2,176	2,474	1,109	24,635	3.95%	
7	Greece	1,172	5,642	4,654	5,583	4,589	824	22,460	3.60%	
8	Taiwan (ROC)	283	3,527	13,246	1,666	1,288	1,409	21,418	3.44%	
9	UAE	608	2,140	2,790	2,550	6,414	5,217	19,715	3.16%	
10	Egypt	291	5,688	4,715	3,612	2,666	2,134	19,103	3.07%	
11	Pakistan	966	3,407	3,165	2,212	3,685	5,216	18,652	2.99%	
12	United States	1,879	3,514	2,514	2,502	3,908	4,101	18,415	2.95%	
13	Australia	691	1,633	1,938	3,569	3,018	4,271	15,122	2.43%	
14	Israel	24	4,079	3,033	1,953	3,946	864	13,898	2.23%	
15	United Kingdom	205	3,417	2,418	3,888	2,036	1,895	13,858	2.22%	
16	Singapore	235	1,370	2,235	1,739	3,672	2,917	12,168	1.95%	
17	Algeria	455	1,992	918	1,653	3,542	3,162	11,721	1.88%	
18	Iran	193	3,352	1,793	1,791	938	290	8,355	1.34%	
19	Afghanistan	2,183	3,441	-	34	588	1,844	8,093	1.30%	
20	Spain	884	2,185	1,441	1,219	1,583	776	8,086	1.30%	
21	Germany (FRG)	755	3,143	1,272	560	1,370	679	7,777	1.25%	
22	Canada	67	1,921	1,450	2,033	1,185	953	7,609	1.22%	
23	Brazil	750	784	1,877	1,148	954	1,223	6,734	1.08%	
24	Malaysia	38	368	2,195	413	3,001	586	6,602	1.06%	
25	Thailand	270	2,114	2,407	614	202	982	6,589	1.06%	
26	Norway	646	1,274	704	461	2,255	987	6,325	1.01%	
27	Chile	141	585	1,109	593	2,939	902	6,268	1.01%	
28	Italy	196	927	1,220	1,705	1,441	668	6,156	0.99%	
29	Kuwait	128	2,476	2,568	382	310	257	6,122	0.98%	
30	Iraq	1,485	781		72	1,545	1,818	5,700	0.91%	
31	Others	10,808	28,706	24,861	19,771	29,128	31,201	144,421	23.17%	
	Total	35,914	131,648	128,580	96,678	120,759	109,641	623,221	100.00%	
	GCC countries	2,351	13,098	17,236	5,691	9,543	11,264	59,183		

Source: Stockholm International Peace Research Institute (2014a).

For the Middle East, between 1989 and 2013, Iran's arms imports were almost 1.5 times that of Iraq. In addition, in this period, the arms imports of the Cooperation Council for the Arab States of the Gulf (GCC) accounted for 7 times that of Iran, and the GCC arms imports were 4.25 times that of Israel. It should also be noted that the GCC was formed in an agreement in 1981 between Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and United Arab Emirates in order to confront the challenges of security and economic development in the area. The GCC is a regional common market. Furthermore, it has a defense planning council (Global Security.org, 2014; Cooperation Council for the Arab States of the Gulf, 2012). The members of the GCC are Islamic states. They have similar political systems and common objectives. Initially, the

objective of the GCC was to protect itself from the threats resulting from the Iran-Iraq War, as well as Iranian-inspired Islamic activism (Global Security.org, 2014).

#### 2.4.2 Arms transfers in ASEAN countries

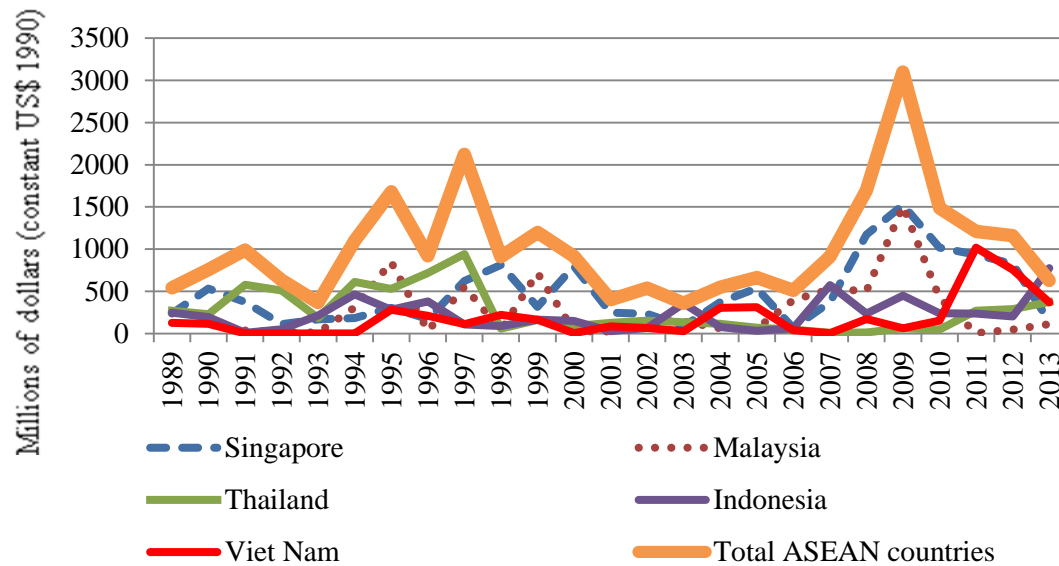
The top 30 largest arms importing countries, three are members of the Association of Southeast Asian Nations (ASEAN). ASEAN consists of 10 countries: Brunei Darussalam, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam. These countries imported US\$ 42,320 million (Trend Indicator Values, in constant 1990 US\$), 6.79% of all arms transferred between 1989 and 2013 (Table 3). Singapore, Malaysia, and Thailand were the three largest arms importers in this region. Singapore had 28.75% of the total ASEAN arms imports. The market shares of Malaysia and Thailand were 15.60% and 15.57%, respectively. The trend of ASEAN arms imports fluctuated over the period (Figure 3). Thailand's arms imports had a large share of ASEAN arms imports between 1991 and 1997. Due to the financial crisis in Southeast Asia in 1997, the quantity of arms imports dropped sharply. The increase between 2006 and 2009 was mainly driven by the demand for arms of Singapore and Malaysia. Vietnam also imported more than US\$ 1,000 million (Trend Indicator Value in constant 1990 US\$) in 2011. That was the highest level of arms imports by Vietnam between 1989 and 2013.

Table 3 ASEAN arms imports by country, 1989-2013, (TIVs) expressed in US\$ million at constant (1990) prices

No.	Country	Arms Imports							Share of ASEAN arms imports	Share of world arms imports
		1989	1990-1994	1995-1999	2000-2004	2005-2009	2010-2013	Total		
1	Singapore	235	1,370	2,235	1,739	3,672	2,917	12,168	28.75%	1.95%
2	Malaysia	38	368	2,195	413	3,001	586	6,602	15.60%	1.06%
3	Thailand	270	2,114	2,407	614	202	982	6,589	15.57%	1.06%
4	Indonesia	248	940	1,023	679	1,357	1,452	5,697	13.46%	0.91%
5	Myanmar	34	984	872	599	592	1,655	4,735	11.19%	0.76%
6	Viet Nam	128	116	987	490	595	2,297	4,613	10.90%	0.74%
7	Philippines	19	242	201	59	64	152	738	1.74%	0.12%
8	Cambodia	119	120	54	-	74	152	519	1.23%	0.08%
9	Brunei	-	6	60	5	36	313	420	0.99%	0.07%
10	Laos	-	8	100	43	37	52	239	0.56%	0.04%
Total ASEAN Arms Imports		1,091	6,268	10,134	4,641	9,630	10,558	42,320		6.79%
Total World Arms Imports		35,914	131,648	128,580	96,678	120,759	109,641	623,221		

Source: Stockholm International Peace Research Institute (2014a).

Figure 3 ASEAN arms imports, 1989-2013 (TIVs) expressed in US\$ m. at constant (1990) prices



Source: Stockholm International Peace Research Institute (2014a).

## 2.5 Global wars

This part consists of three subparts. The first subpart presents the factors that might lead to war. The second subpart presents ideas about the patterns of war. The third subpart presents the number of wars from 1989 to 2013.

### 2.5.1 Global capitalism, natural resources and war

Literature suggests a whole range of factors can lead to war; capitalism, natural resources, glory, dynastic interest, racial domination, ethnic cleansing, religious differences, the strategic acquisition of land, identity, statization, etc. (Ross 2004). It should be noted that in this thesis, statization means the establishment of a nation-state.

The linkage between capitalism and war can be indicated by the interaction between industry and government. In this relationship, the elites control governments tightly (Stander, 2014). They have enough power to influence foreign policies. The relationship between capitalism and the state allows the major manufacturers to arm countries with various types

of weapons; guns, tanks, warships, aircraft, and even rockets. In the meantime, most these arms are made and sold by private firms from Europe and the United States. It is known that arms are not only distributed to governments, but some are supplied to all sorts of so-called rebel movements (Stander, 2014). As a result, it is clear that the profits of arms producers and the availability of arms are significant factors affecting wars.

Literature also suggests that natural resources correlate with armed conflicts (Ross 2004). Natural resources may be related to armed conflicts through two channels; motivating and financing armed conflicts. Natural resources themselves are the target of military intervention by foreign country. According to Stander (2014), resource wars have been central to armed conflict since the emergence of the capitalist era. The resources in question may be land, timber, water, waterways, copper, iron, gold, silver, diamonds, coal, gas, oil, and so on. It is now the case that access to oil and natural gas supplies have led to ongoing conflicts. It is not only in the Middle East that oil and natural gas have been the root of wars; they also have been the root of war in other places such as Africa, East Timor, and the Caucasus. Conflicts over oil began at the earliest stage of the technological shift away from coal. It can be traced back to the important role of oil in shaping the United Kingdom's foreign policy in the Middle East. The United Kingdom attempted to gain control of oil reserves of the Middle East through the development of the Anglo-Persian agreement of 1919. However, this agreement was opposed by other advanced countries in order to forestall the monopoly of the United Kingdom.

In addition, the United States, as well as other advanced countries, have attempted to control the oil reserves in the Middle East. Jimmy Carter, the President of the United States from 1977 to 1981 (University of Virginia, 2014), and awarded the 2002 Nobel Peace Prize (Nobelprize.org, 2014), demonstrated the standpoint of the United States. He made his position clear in relation to the Persian Gulf region. In both the national interest and that of multinational corporations based in the United States, he stated *“An attempt by any outside force to control the Persian Gulf region will be regarded as an assault on the vital interests of the USA, and such an assault will be repelled by any means necessary, including military force.”* Successive governments of the United States invaded Iraq in response to the invasion of Kuwait and the threat

of weapons of mass destruction in Iraq under Saddam Hussein's control (Stander, 2014).

The United States frequently appears to take the lead in resources wars, with regard to oil and natural gas in particular (Stander, 2014; Uppsala Universitet, 2014). Before the end of World War II, in 1945, the United States protected the Saudi dynasty in return for rights for US multinational oil corporations to conduct oil exploration and production. The security of the ruling dynasty in Saudi Arabia has remained a matter of national interest for the United States since then. Since the end of World War II, the Middle East's oil has been controlled by the United States and the United Kingdom.

According to Stander (2014), the objective of the foreign policy of the United States is to capture as much of the world's supply of oil as possible. It is argued that the invasion of Iraq in 2003 was about profit and regime change with the intention to remove Saddam Hussein and replace him with a government friendly to the United States. There was no evidence of any justification for this invasion in international law. There were no weapons of mass destruction. Also, there is no clear evidence of any connection between Saddam and Al-Qaeda. The invasion was about oil and profit and maintaining the political hegemony of the United States. Large US corporations collude with the government to amass profit and protect the national interest.

The United Kingdom expressed the same standpoint as the United States. The UK Admiralty memorandum of 1922 contains the statement "*From the strategic point of view, the essential thing is that Great Britain should control the territories on which the oil is situated*" (Ferguson, 2004). After World War II, the United Kingdom worked together with the United States to ensure control over the Middle East's oil. The United Kingdom has also exerted considerable influence in Saudi Arabia with lucrative deals for UK arms industries via the Al-Yamamah arms contracts. The United Kingdom's interest in oil and arms was manifested in the interests of British Petroleum and BAE Systems (Stander, 2014).

Other advanced countries also engaged in resource wars. Sometimes they were in competition with the United States, sometimes in harmony with the United States, and sometimes in conflict with other advanced countries.

### **2.5.2 Patterns of war**

War has changed in several dimensions. Previously, most wars were interstate wars. At the beginning of the 20<sup>th</sup> century, the majority of wars were between countries. There was World War I, World War II, and wars of liberation from colonialism. Wars or violence with the assertion of ethnic identity increased in the 1960s. Governments were overthrown and new ones established. The Cold War between the United States and the Union of Soviet Socialist Republics (USSR) started when World War II ended. While some people consider the Cold War as a war between communism and capitalism, some people regard it as a war about the threat of nuclear weapons, possession of the world economy, and territorial control. Moreover, there were wars against international criminal cartels and wars against religious fundamentalism that have continued to the present (Marsella, 2011).

The pattern of war has gradually changed. Nowadays, most wars are intrastate wars that are influenced by a third party. For instance, the war between the government of Iraq and Al-Mahdi Army, Ansar al-Islam and ISIS has been intervened in by the United States and its allies. Another example is the war between the government of Yemen (North Yemen in particular) and AQAP that has been intervened in by the United States (Uppsala Universitet, 2014).

The second change is the powerful countries that have influenced wars. After World War II, the world entered the Cold War. The main Cold War enemies were the USSR and the United States. Other nations gathered into three groups. The first group consists of democratic nations led by the United States. The second group includes communist nations led by the USSR, and the third group is the non-aligned group. This group of countries did not want to be tied to either the communist group or the democratic group (Global Security.org, 2014). During the Cold War, almost all wars were in the form of proxy wars between two sides, the communist and democratic nations, for instance, the Korean War



between 1950 and 1953, and the Vietnam War between 1962 and 1975. This type of war ended with the Cold War in 1991 when the USSR collapsed, and then returned after the 9/11 situation in 2001. An example is the Syrian Civil War from 2011 to the present. After the end of the Cold War era, the democratic political system of the United States became the sole superpower.

There is another viewpoint from which the pattern of war can be categorized. From this point of view, there are Old Wars and New Wars. The Old Wars are the wars of nation-state formation and conflicts between the great powers of the twentieth century. One distinction between the Old Wars and New Wars is the length of the wars. In comparison, the Old Wars were short. Another difference is that these wars were fought with definite aims with the purpose of ensuring a sought-after peace settlement, in circumstances where the state had the monopoly of legitimate violence. In the Old Wars, it is possible to separate war-time from peace-time by means of a treaty or treaties. In the New Wars, however, there is no accepted government to ensure these conditions exist. Furthermore, there are no distinct peace as opposed to war conditions. War is protracted. There may be truces from time to time, but there is no mechanism by which such agreements can be enforced (Stander, 2014).

It is argued that more or less all of the New Wars have their historical roots in colonial origins (Münkler, 2005). This applies to Africa, the Balkans and South-East Asia. In conflict areas, the lack of a stable state and the existence of corruption increase the possibility of conflict. In addition, the crucial factor that determines whether a war develops or not is the existence of military superpowers from outside, from Europe or North America in particular. Münkler (2005), with the support of Stander (2014), argued that war is not caused by poverty though it may be prolonged or inflamed by conditions of poverty. The reason supporting this idea is that the poor rarely have the organization or resources to sustain conflict. On the other hand, it is the rich who make war in order to protect or increase their wealth.

According to Kaldor (2007), the New Wars are marked by the predations of corrupt elites. The fighting is caused by ad hoc armed bands, militias, and tribal groups. Wars of this pattern are mostly intra-national wars in which civilians suffer most, and the elite groups support and finance violence in pursuit of raw materials of one sort or another, which are sold

on world markets or by criminal means. However, Hirst (2001) argued that New Wars involve old problems. In his opinion, the New Wars can be traced back to previous historical events such as the problems associated with the aftermath of the decline of the Ottoman Empire and the drive towards self-determination by certain ethnic groups. Conflicts between Serbs and Bosnians are examples of this type of war. In this sense, the conflict in the South of Thailand is labeled as a New War.

Stander (2014) concluded that the New Wars are ‘new’ because they are caused by nation-states backing national, and in some circumstances, international capital in their search for raw materials for profit and the continuous accumulation of capital. They are ‘new’ because of the impact of the defense industry on international politics and foreign affairs. In addition, they are also ‘new’ because the hegemonic powers decide what a just war is. The hegemonic powers decide on what constitutes human rights and when humanitarian aid can be given in an armed conflict or a situation of violence. Moreover, the hegemonic powers decide when democracy is impossible to implement.

### **2.5.3 The number of wars from 1989 to 2013**

Wars have taken place in various regions. According to Uppsala Universitet (2014), from 1989 to 2013 there were 144 wars in 82 nations. It should be noted that the definition of such war is war that is officially declared by the governments of the participating countries. An unofficial war is not included. For example the Libya war and the Yemen war during 2010-2013 are not counted as involvement by the United States. Table 4 shows that the United States was involved in only 16 wars during this period. However, based on information from other sources such as Grossman (2012)) and the Global-Policy-Forum (2005), it is found that the United States conducted military operations in foreign countries in almost every year between 1946 and 2013.

Evidence shows that, from 1989 to 2013, 27 wars were officially intervened in by at least one of the 27 arms exporting countries (Table 5). The Afghanistan war, the Iraq war, the Iraq-Kuwait war, the Balkan war, the USA-Al Qaida war and the Mali war were intervened in by at least 10 arms exporting countries.

Table 4 Category of arms exporting countries and frequency of war participation, 1989-2013 (25 years in total)

Economic Development Level	Arms Exporting Country	War Participation																									Total	
		1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013		
Economically Developed Country	1 Belgium			✓													✓		✓		✓		✓		✓	✓	12	
	2 Canada			✓									✓				✓		✓		✓		✓		✓		✓	15
	3 Czech Republic																	✓		✓		✓		✓		✓		11
	4 Denmark			✓														✓		✓		✓		✓		✓		14
	5 Finland																		✓		✓		✓		✓		✓	8
	6 France			✓														✓		✓		✓		✓		✓		15
	7 Germany																	✓		✓		✓		✓		✓		14
	8 Israel		✓			✓												✓		✓		✓		✓		✓		24
	9 Italy			✓														✓		✓		✓		✓		✓		15
	10 Netherlands			✓														✓		✓		✓		✓		✓		15
	11 Norway			✓														✓		✓		✓		✓		✓		14
	12 Poland																	✓		✓		✓		✓		✓		14
	13 South Korea																	✓		✓		✓		✓		✓		9
	14 Spain			✓														✓		✓		✓		✓		✓		14
	15 Sweden																		✓		✓		✓		✓		✓	8
	16 Switzerland																		✓		✓		✓		✓		✓	2
	17 UK		✓															✓		✓		✓		✓		✓		19
	18 USA		✓															✓		✓		✓		✓		✓		16
	19 USSR/Russia		✓															✓		✓		✓		✓		✓		22
	20 Belarus																											0
	21 Brazil																											0
	22 China																						✓					2
	23 Czechoslovakia			✓																								1
	24 North Korea																											0
	25 South Africa																											2
	26 Ukraine																						✓		✓		✓	8
	27 Uzbekistan																											5

Source: Uppsala Universitet (2014).

Table 5 List of wars intervened by at least one of the 27 arms exporting countries, 1989-2013

No.	Location of war	Arms Exporting Country																											Total			
		USA	UK	USSR/Russia	France	Italy	Norway	Spain	Belgium	Denmark	Netherlands	Canada	Czech Republic	Germany	Poland	China	Finland	Israel	South Korea	South Africa	Sweden	Switzerland	Uzbekistan	Ukraine	Czechoslovakia	Switzerland	Belarus	Brazil		North Korea		
1	Afghanistan	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	20	
2	Serbia (Yugoslavia)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	13	
3	USA, Al-Qaida	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	13	
4	Iraq, Kuwait	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	12	
5	Iraq, Kuwait	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	11	
6	Mali	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10	
7	Tajikistan	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	2	
8	Uzbekistan	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1	
9	Australia, Iraq, UK, USA	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	2	
10	Central African Republic	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	2	
11	China	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1	
12	Georgia	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1	
13	Israel (Palestine)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1	
14	Israel (Southern Lebanon)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1	
15	Lesotho	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1	
16	Mauritania	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1	
17	Panama, USA	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1	
18	Russia (Soviet Union) (Nagorno-Karabakh)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1	
19	Russia (Soviet Union) (Azerbaijan)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1	
20	Russia (Soviet Union) (Parliamentary)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1	
21	Russia (Soviet Union) (Chechnya)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1	
22	Russia (Soviet Union) (Dagestan)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1	
23	Russia (Soviet Union) (Caucasus Emirate)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1	
24	Sierra Leone	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1	
25	Spain (Basque)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1	
26	UK (Northern Ireland)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1	
27	Yemen	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1
	Total	9	9	9	9	7	6	6	6	6	6	5	5	5	4	4	4	4	4	4	4	2	2	2	2	2	2	2	2	2	1	0

Source: Uppsala Universitet (2014).

## 2.6 Military expenditure

Military expenditure is a part of total government spending. A large amount of money has been spent as military expenditure (Table 6 and Table 7). North America made up 40.16% of total world military expenditure between 1989 and 2013 whereas European countries accounted for 30.13% of the total world military expenditure in this period. It seems that arms exporting countries spend a lot more of their budget on military expenditure than arms importing countries (Table 7). The United States, for example, made up 38.80% of total world military expenditure between 1989 and 2013. In addition, evidence shows that arms exporting countries with higher volumes of military expenditure have a tendency to export more arms. The United States is the main example that supports this statement. While having the largest share of total world military expenditure (SIPRI, 2014c), it has almost a monopoly in the conventional arms market. This will be demonstrated empirically in subpart 2.7.2.

Table 6 Military expenditure by country, 1989-2013, in constant (2011) US\$ m.

Country	Military Spending							Share (%)
	1989	1990-1994	1995-1999	2000-2004	2005-2009	2010-2013	Total	
Africa	15,031.30	70,988.70	76,482.20	102,528.20	121,163.40	123,339.60	509,533.40	1.52
North Africa	3,048.00	17,945.00	24,415.00	33,136.00	43,755.00	54,079.00	176,378.00	0.53
Sub-Saharan	11,983.30	53,043.70	52,067.20	69,392.20	77,408.40	69,260.60	333,155.40	0.99
Asia	181,234.88	1,054,993.86	1,134,525.74	1,429,731.33	1,906,607.31	1,885,922.83	7,593,015.95	22.63
Central Asia	-	1,529.50	3,138.10	3,810.80	7,526.00	9,249.00	25,253.40	0.08
East Asia	104,958.58	598,935.16	678,859.74	819,561.53	1,110,902.31	1,148,249.83	4,461,467.15	13.29
South Asia	24,248.30	122,398.20	147,355.90	187,590.00	246,529.00	243,841.00	971,962.40	2.90
Middle East	52,028.00	332,131.00	305,172.00	418,769.00	541,650.00	484,583.00	2,134,333.00	6.36
Oceania	17,230.00	89,135.00	92,446.60	104,732.60	128,304.00	111,298.60	543,146.80	1.62
Europe	725,250.73	2,166,625.11	1,733,656.74	1,841,312.34	2,009,874.50	1,634,224.80	10,110,944.22	30.13
Americas	610,334.70	2,679,824.70	2,245,741.80	2,629,985.92	3,531,759.21	3,105,046.99	14,802,693.33	44.11
North America (including USA)	572,441.00	2,473,802.00	2,025,527.00	2,380,207.00	3,224,584.00	2,801,517.00	13,478,078.00	40.16
Central America and the Caribbean	3,835.10	21,870.90	23,788.50	25,790.62	30,690.71	32,372.69	138,348.53	0.41
South America	34,058.60	184,151.80	196,426.30	223,988.30	276,484.50	271,157.30	1,186,266.80	3.53
***USA	551,839.00	2,378,190.00	1,946,219.00	2,298,853.00	3,123,011.00	2,721,398.00	13,019,510.00	38.80
Total	1,549,081.61	6,061,567.37	5,282,853.09	6,108,290.40	7,697,708.42	6,859,832.82	33,559,333.70	

Source: Stockholm International Peace Research Institute (2014c).

Table 7 Military expenditure by country, 1989-2013, in constant (2011) US\$ m.

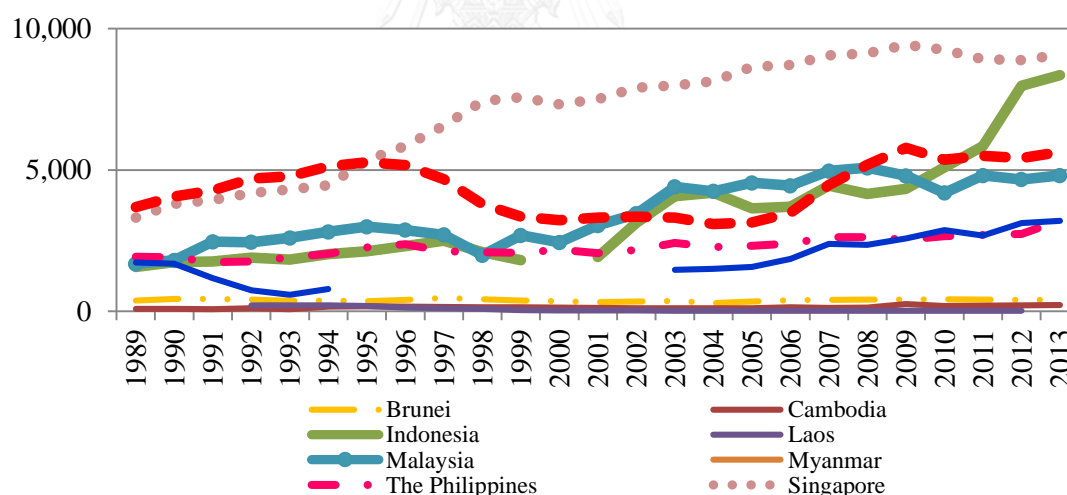
Group of country	No.	Arms Exporting country	Military Spending					2010-2013	Total	
			1989	1990-1994	1995-1999	2000-2004	2005-2009			
Economic	1	USA	551,839	2,378,190	1,946,219	2,298,853	3,123,011	2,721,398	13,019,510	
Developed	2	USSR/Russia	344,074	459,182	144,600	182,070	279,792	301,904	1,711,622	
Arms Exporting Country	3	France	70,841	346,598	316,429	317,474	330,747	256,892	1,638,981	
	4	UK	58,741	278,531	236,660	265,790	304,419	237,174	1,381,315	
	5	Germany	67,995	316,044	257,448	247,280	235,127	196,356	1,320,250	
	6	Italy	38,353	182,799	185,230	216,811	204,216	145,124	972,533	
	7	South Korea	14,826	81,925	96,603	106,574	135,743	124,632	560,303	
	8	Canada	20,602	95,612	79,308	81,354	101,573	80,119	458,568	
	9	Israel	13,284	75,283	67,272	80,884	82,234	63,465	382,422	
	10	Spain	16,386	72,375	68,705	73,794	88,202	57,489	376,951	
	11	Netherlands	13,943	63,466	56,756	57,888	61,652	45,165	298,870	
	12	Sweden	8,273	39,450	38,409	37,658	33,673	25,978	183,441	
	13	Poland	7,140	28,782	31,043	33,706	42,641	37,750	181,062	
	14	Norway	5,859	29,706	28,240	31,612	33,478	29,092	157,987	
	15	Belgium	8,497	36,083	30,587	29,017	28,860	21,932	154,976	
	16	Switzerland	7,923	38,316	32,331	27,434	24,927	20,020	150,951	
	17	Denmark	4,744	23,719	23,254	23,354	23,316	18,638	117,025	
	18	Finland	2,724	14,298	14,138	14,873	17,725	13,920	77,678	
	19	Czech Republic	N/A	5,955	14,664	17,113	16,865	9,860	64,457	
	Economic	20	China	18,336	111,856	139,173	256,244	487,580	614,508	1,627,697
	Developing	21	Brazil	23,280	117,794	111,144	131,954	149,365	148,876	682,413
Arms Exporting Country	22	South Africa	7,656	26,745	17,330	19,713	22,670	18,768	112,882	
	23	Ukraine	N/A	2,491	10,934	11,787	19,590	17,834	62,636	
	24	Czechoslovakia	12,483	17,979	N/A	N/A	N/A	N/A	30,462	
	25	Belarus	N/A	1,300	900	1,474	3,142	3,183	9,999	
	26	Uzbekistan	N/A	55	290	319	N/A	N/A	664	
	27	North Korea	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Other countries			231,283	1,217,033	1,335,186	1,543,261	1,847,160	1,649,756	7,823,679	
Total			1,549,082	6,061,567	5,282,853	6,108,290	7,697,708	6,859,833	33,559,334	

Source: Stockholm International Peace Research Institute (2014c).

Table 6 and Table 7, as well as elsewhere in this thesis, present figures on the amount of military expenditure, which are obtained from the database of SIPRI (2014c), although the figures for some countries do not include military pensions. Furthermore, for some countries, the figures represent the budget, rather than actual expenditure. Moreover, for some countries, the figures do not include spending on paramilitary forces. In addition, some countries changed or redenominated their currency during the period, so all current price local currency figures have been converted to the latest currency. It should also be noted that some figures are highly uncertain as figures for some countries in some periods are estimated by SIPRI. The data for some countries in some periods are unavailable.

With reference to the dataset and in ASEAN countries, from 1989 to 2013 ASEAN has seen growth in military expenditure (Figure 4). Singapore has been the largest military spender since 1995. The growth in the military expenditure of Singapore between 1989 and 2013 was 173.98% with an average annual growth rate of 4.29%. The growth of military expenditure of Malaysia, Indonesia and the Philippines between 1989 and 2013 was 185.74%, 430.88% and 66.30%, respectively. Their average annual growth rate during the same period was 4.47%, 7.20% and 2.14%, respectively. The growth of military expenditure of Vietnam between 2003 and 2013 was 117.88% with an average annual growth rate of 8.10% while the military expenditure of Thailand decreased sharply between 1996 and 2000. This might be the consequence of economic sluggishness in Thailand. After four years of increases from 2005 to 2010, Thailand's military expenditure reached US\$ 5,362.15 (in constant 2011 US\$).

Figure 4 Military expenditure of ASEAN countries by country, 1989-2013, in constant (2011) US\$ m.



Source: Stockholm International Peace Research Institute (2014c).

Compared to GDP, Brunei, Singapore and Vietnam were the top three largest military spenders in ASEAN (Table 8). The average share of military expenditure in the GDP of Brunei, Singapore, and Vietnam between 1989 and 2013 was 4.64%, 4.36%, and 3.19%, respectively. Furthermore, taking into account the fluctuations, the average share of military expenditure of the GDP of Thailand was 1.84%.

Table 8 Military expenditure of ASEAN by country, 1989-2013, in constant (2011) US\$ m.

Country	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Average	
Brunei	385.00	435.00	434.00	414.00	366.00	378.00	361.00	405.00	471.00	425.00	380.00	359.00	331.00	352.00	367.00	290.00	351.00	395.00	409.00	422.00	414.00	432.00	415.00	407.00	402.00		
Military spending																											
Growth (%)	12.99	-0.23	-4.61	-11.59	3.28	-4.50	12.19	16.30	9.77	-10.59	-5.53	-7.80	6.34	-4.26	-20.98	21.03	12.54	3.54	3.18	-1.90	-4.55	3.94	-1.93	-1.23	0.18		
Share to GDP (%)	6.20	6.40	6.40	6.20	5.70	6.00	5.50	6.20	7.20	7.50	6.10	5.70	5.20	5.30	3.70	2.50	2.60	2.60	2.60	2.50	3.30	3.20	2.50	2.50	2.50	4.64	
Cambodia																											
Military spending	83.70	89.50	77.10	112.00	79.30	163.00	182.00	168.00	159.00	142.00	147.00	136.00	123.00	114.00	114.00	111.00	114.00	140.00	128.00	135.00	264.00	194.00	204.00	210.00	228.00		
Growth (%)	6.93	-13.85	45.27	-29.20	105.55	11.66	-7.69	-5.36	-10.69	3.52	-7.48	-9.56	-7.32	0.00	-2.63	2.70	22.81	-8.57	5.47	95.56	-26.52	5.15	2.94	8.57	4.26		
Share to GDP (%)	2.00	2.10	2.30	3.10	1.80	3.80	3.60	3.20	3.00	2.70	2.50	2.20	1.80	1.60	1.50	1.30	1.20	1.30	1.10	1.20	2.20	1.60	1.60	1.60	1.60	2.08	
Indonesia	1,574.00	1,739.00	1,769.00	1,905.00	1,829.00	2,021.00	2,127.00	2,312.00	2,503.00	2,095.00	1,808.00	1,925.00	3,130.00	4,079.00	4,194.00	3,643.00	3,699.00	4,448.00	4,480.00	4,150.00	4,336.00	5,092.00	5,838.00	7,975.00	8,536.00		
Growth (%)	10.48	1.73	7.09	-3.99	10.50	5.24	8.70	8.26	-16.30	-13.70	..	62.60	30.32	2.82	-13.14	1.54	20.25	-6.70	4.48	17.44	4.48	17.44	14.65	36.61	4.78	7.20	
Share to GDP (%)	0.90	0.90	0.80	0.80	0.80	0.80	0.80	0.80	0.70	0.60	0.60	0.50	0.80	0.80	0.80	0.70	0.80	0.70	0.80	0.60	0.60	0.70	0.70	0.90	0.90	0.77	
Laos																											
Military spending	..	..	215.00	211.00	214.00	192.00	137.00	115.00	87.50	38.30	29.80	28.90	26.80	23.20	22.10	21.30	21.60	21.40	21.30	16.90	18.00	18.70	19.10	..	..		
Growth (%)	..	..	-1.86	-1.42	-10.28	-28.65	-16.06	-23.91	-56.23	-22.19	-3.02	-7.27	-13.43	-4.74	-3.62	1.41	-0.93	-0.47	-20.66	6.51	3.89	2.14	..	..	..		
Share to GDP (%)	..	..	8.60	7.90	7.40	6.10	4.10	3.50	2.60	1.10	0.80	0.70	0.60	0.60	0.50	0.40	0.40	0.40	0.30	0.30	0.20	0.20	0.20	..	..	2.23	
Malaysia	1,683.00	1,808.00	2,461.00	2,445.00	2,598.00	2,815.00	2,993.00	2,878.00	2,705.00	1,988.00	2,690.00	2,442.00	3,038.00	4,402.00	4,248.00	4,544.00	4,447.00	4,965.00	5,078.00	4,793.00	4,187.00	4,807.00	4,664.00	4,899.00			
Growth (%)	7.43	36.12	-0.65	6.26	8.35	6.52	-3.84	-6.01	-26.51	35.31	-9.22	24.41	13.63	27.52	-3.50	6.97	-2.13	11.65	2.28	-5.61	-12.64	14.81	-2.97	3.11	4.47		
Share to GDP (%)	2.60	3.20	3.00	2.90	2.80	2.80	2.40	2.10	1.60	2.10	1.60	1.60	2.10	2.20	2.60	2.30	2.20	2.00	1.90	2.00	1.60	1.70	1.50	1.50	2.25		
Myanmar																											
Military spending	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
Growth (%)	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
Share to GDP (%)	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
The Philippines	1,929.00	1,907.00	1,746.00	2,035.00	2,267.00	2,576.00	2,122.00	2,095.00	2,068.00	2,186.00	2,062.00	2,171.00	2,419.00	2,279.00	2,322.00	2,401.00	2,630.00	2,630.00	2,532.00	2,657.00	2,701.00	2,739.00	2,799.00	3,208.00			
Growth (%)	-1.14	-8.44	1.03	8.11	6.71	11.40	4.81	-10.69	-1.27	-1.29	5.71	-5.67	5.29	11.42	-5.79	1.89	3.40	9.54	0.00	-3.73	4.94	1.66	1.41	17.12	2.14		
Share to GDP (%)	2.20	2.10	2.00	2.00	2.20	2.20	2.30	1.90	1.70	1.60	1.60	1.50	1.50	1.60	1.40	1.30	1.30	1.30	1.30	1.30	1.20	1.20	1.20	1.30	1.66		
Singapore	3,313.00	3,802.00	3,934.00	4,182.00	4,315.00	4,459.00	5,341.00	5,851.00	6,567.00	7,436.00	7,575.00	7,327.00	7,502.00	7,909.00	8,138.00	8,645.00	8,718.00	9,055.00	9,126.00	9,430.00	9,250.00	8,921.00	8,890.00	9,077.00			
Growth (%)	14.76	3.47	6.30	3.18	3.34	19.78	9.55	12.24	13.23	1.87	-3.27	2.39	5.43	0.99	1.89	6.23	0.84	3.87	0.78	3.33	-1.91	-3.56	-0.35	2.10	4.29		
Share to GDP (%)	4.70	4.90	4.70	4.30	4.00	4.40	4.40	4.60	5.40	5.30	4.60	4.90	5.00	5.00	4.90	4.40	4.00	3.70	3.90	4.00	3.50	3.40	3.40	3.40	4.36		
Thailand	3,692.88	4,064.43	4,272.14	4,696.70	4,778.15	5,129.83	5,271.48	5,170.88	4,672.40	3,787.46	3,351.32	3,226.74	3,319.86	3,350.67	3,315.85	3,088.22	3,141.85	3,482.88	4,474.88	5,178.53	5,786.06	5,362.15	5,501.44	5,419.91	5,638.13		
Growth (%)	10.06	5.11	9.94	1.73	7.36	2.76	-1.91	-9.64	-18.94	-11.52	-3.72	2.89	0.93	-1.04	-6.87	1.74	10.85	28.48	15.72	11.73	-7.33	2.60	-1.48	4.03	1.78		
Share to GDP (%)	2.74	2.72	2.63	2.67	2.51	2.47	2.33	2.19	2.04	1.83	1.62	1.49	1.43	1.32	1.15	1.12	1.18	1.43	1.64	1.82	1.56	1.59	1.50	1.51	1.84		
Viet Nam																											
Military spending	1,733.00	1,682.00	1,181.00	745.00	584.00	796.00	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
Growth (%)	..	..	-2.94	-29.79	-36.92	-21.61	36.30	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
Share to GDP (%)	7.70	7.90	5.60	3.40	2.30	2.60	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
Average mil. share to GDP (%)	3.63	3.70	3.45	3.83	3.38	3.56	3.48	3.20	3.13	2.99	2.61	2.25	2.27	2.30	2.15	1.84	1.77	1.73	1.77	1.74	2.01	1.78	1.68	1.69	1.69	2.55	

Remark: ". ." = data unavailable.

Source: Stockholm International Peace Research Institute (2014c).



Military expenditure can be used in many ways. In addition to procuring arms, hiring military personnel and conducting R&D, some arms exporting countries have provided military training and assistance overseas. The United States, for instance, has provided International Military Education and Training (IMET) programs, other special operations training programs, as well as exercises between the United States and foreign military forces. In 1997, there were 24 countries that experienced at least one armed conflict (SIPRI, 1998) with the United States providing arms or military training to 21 countries at some period during the 1990s. Additionally, according to Dufour (2007), the United States is thought to own a total of 737 bases in foreign lands. This might be the result of defense industry complexity in the United States. The details of this will be discussed in depth in Chapter 4.

Table 4 and Table 7 show that it is clear that countries with high military expenditure participated in wars frequently. This implies that for arms exporting countries, military expenditure is an indicator of war participation.

## **2.7 The relationship between arms transfers, war participation, military expenditure, and the economic situation**

### **2.7.1 Methodology**

This part employs secondary data of arms exporting countries. Data are obtained from various sources. Data on Nominal Gross Domestic Product, the inflation rate, and the share of government expenditure are obtained from the IMF (2014). Data on arms transfers, the list of arms exporting countries, and the share of military expenditure are obtained from SIPRI (2014a; 2014b; 2014c), and the data on war participation are obtained from Uppsala Universitet (2014).

Data from 1989 to 2013 are used to investigate relationships. The relationship between arms transfers and military expenditure, and between arms transfers and war participation, are analyzed by using the simple regression method. Qualitative methods

are employed to investigate the relationship between arms exporting countries' war participation and their economic situation.

### **2.7.2 The relationship between military expenditure and arms transfers of arms exporting countries**

This subpart provides the analysis of results with regard to the relationship between military expenditure and arms transfers of arms exporting countries using secondary data from 1989 to 2013.

The model in Equation (1) expresses the relationship between the cumulative volume of military expenditure and the cumulative volume of arms transfers. The model is derived from the knowledge that military expenditure creates technological progress. Advanced technology, then, builds competitiveness. As a result, an arms exporting country with higher military expenditure can export more weapons than an arms exporting country with lower military expenditure. In addition, there is an argument that an arms exporting country with higher military expenditure attempts to export arms in order to reduce the cost burden of military expenditure. In this case, it is argued that most of the exported arms, at least in part, are subsidized by the government of that arms exporting country in order to increase competitiveness over other arms exporting countries. Therefore, a country with higher military expenditure can export more arms.

$$\ln AEx_i = \eta_0 + \eta_1 \ln Mil_i + \varepsilon \quad (1)$$

where  $\ln AEx_i$  = natural log of the volume of arms transfers from 1989 to 2013 of an arms exporting country  $i$  (Unit: SIPRI Trend Indicator Values (TIVs) expressed in US\$ m. at constant (1990) prices)

$\ln Mil_i$  = natural log of the volume of military expenditure from 1989 to 2013 of an arms exporting country  $i$  (Unit: US \$m., at constant 2011 prices and exchange rates, except for the volume in 2013, which is in US\$ m. at 2013 prices and exchange rates)

$\eta_0, \eta_1$  = constant and coefficient of the natural log of the volume of military expenditure

$\varepsilon$  = error term

The results of the estimation are presented in Equation (2) and Figure 5.

$$\widehat{\ln AEx}_i = 0.9086 + 0.6259^{***} \ln Mil_i \quad (2)$$

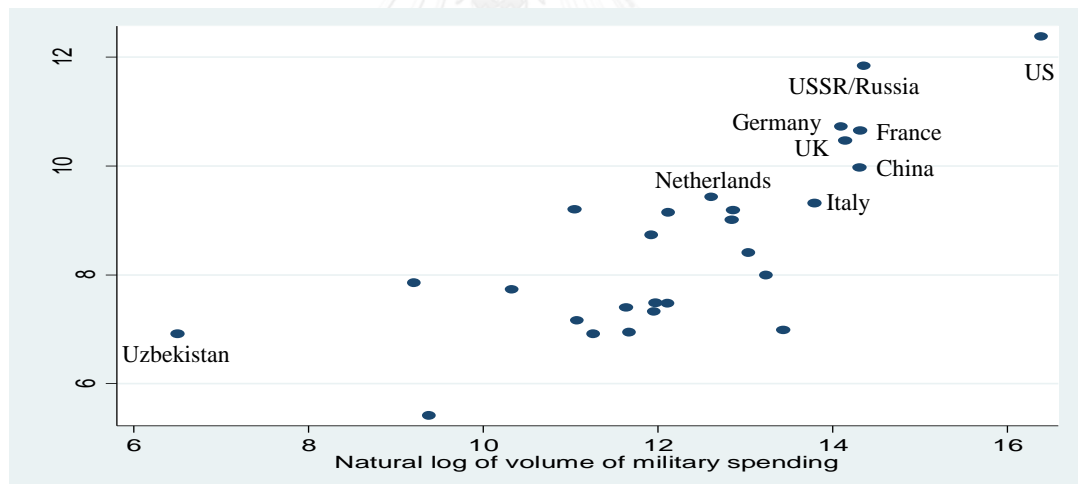
(1.3801) (0.1110)

$$R^2 = 0.5598, \bar{R}^2 = 0.5422, F(1, 25) = 31.80, N = 27$$

Remark: 1) Numbers in parenthesis are standard errors.

2) \*\*\* represents the 99% confidence level.

Figure 5 The relationship between military expenditure and arms transfers



Source: Stockholm International Peace Research Institute (2014b, 2014c).

It is found that, for arms exporting countries, the volume of military expenditure is positively and significantly related to the volume of arms transfers. This implies that an arms exporting country with a higher volume of military expenditure tends to transfer more arms. The United States is clear evidence that supports this finding. It had the largest share of total world military expenditure between 1989 and 2013 (Table 6), and had almost a monopoly in the conventional arms market (Table 1).

According to Equation (2), the constant term implies that an arms exporting country with no military expenditure exports approximately US\$ 2.48 million of arms (in constant 2011). The coefficient of the natural log of the volume of military expenditure implies that an arms exporting country with 1% higher military expenditure has a 0.6259% higher volume of arms transfers. The result shows that when military expenditure increases by 1%, the volume of arms transfers also increases, but by less than 1%. This implies that perhaps the main purpose of increasing military expenditure is not to raise arms transfers. This finding supports the idea that an arms exporting country exports arms in order to reduce its cost burden.  $\bar{R}^2$  shows that 54.22% of the change in the volume of arms transfers can be explained by the change in the volume of military expenditure.

### **2.7.3 The relationship between the frequency of war participation and arms transfers of arms exporting countries**

This subpart analyses how the frequency of war participation in foreign countries is related to the volume of arms transfers of arms exporting countries. This subpart employs secondary data from 1989 to 2013. It is conjectured that an arms exporting country that engages in wars more frequently can export more arms than one that engages in fewer wars. The conjecture comes from the idea that wars are stages for weapon demonstration; marketing theory states that demonstrations are similar to product advertising, which can increase sales.

Many wars serve as arms expos. For instance, the Iraq and Afghanistan wars have tested British armaments (Turnbull, 2014). These examples imply that war participation might be a demonstration strategy in the arms industry. According to marketing theory, demonstrations are useful in addressing uncertainty regarding the quality of an unknown product or innovation. Before experiencing a product, customers are uncertain as to how the product will meet their particular needs. Demonstrations are the equivalent of sampling durable products. They furnish customers with information and experience that affect customer beliefs. As a result, demonstrations might raise sales (Heiman and Ofir, 2010). Since war participation acts as weapon demonstration, it might promote arms exports. The model in Equation (3) is used to investigate the

relationship between war participation and the volume of arms exports or arms transfers.

$$\ln AEx_i = \gamma_0 + \gamma_1 WarP_i + \varepsilon \quad (3)$$

where  $\ln AEx_i$  = natural log of the volume of arms transfers from 1989 to 2013 of an arms exporting country  $i$  (Unit: SIPRI Trend Indicator Values (TIVs) expressed in US\$ m. at constant (1990) prices)

$WarP_i$  = the frequency of war participation of an arms exporting country  $i$  during 1989 and 2013

$\gamma_0, \gamma_1$  = constant and coefficient of the number of war participations

$\varepsilon$  = error term

The study results are expressed as Equation (4) and Figure 6.

$$\widehat{\ln AEx}_i = 7.4425^{***} + 0.1177^{***} WarP_i \quad (4)$$

(0.4754)    (0.0384)

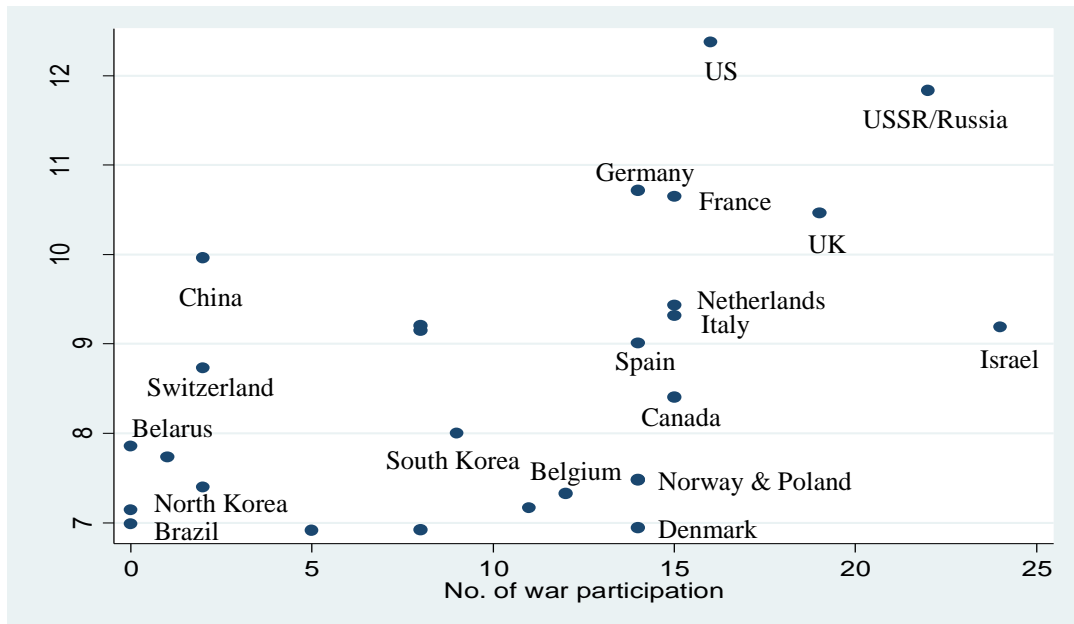
$$R^2 = 0.2729, \bar{R}^2 = 0.2438, F(1, 25) = 9.38, N = 27$$

Remark: 1) Numbers in parenthesis are standard errors.

2) \*\*\* represents the 99% confidence level.

The study result shows that the frequency of war participation of an arms exporting country has a positive relationship with the volume of arms transfers. That means an arms exporting country that engages in wars more frequently might be able to export more arms. The largest arms exporting countries like the United States, the United Kingdom, Russia, France and Germany are examples of arms exporting countries that frequently engage in wars. The study result implies that, apart from other reasons regarding foreign policy, one of the incentives for engaging in wars might be the demonstration and promotion of arms.

Figure 6 The relationship between war participation and arms transfers



Source: Uppsala Universitet (2014) and Stockholm International Peace Research Institute (2014b).

According to Equation (4), the constant term implies that an arms exporting country that does not officially engage in wars, exports approximately US\$ 1,707 million of arms (in constant 2011). The coefficient of the number of war participations implies that, if the frequency of war participation increases by 1, the volume of arms transfers will increase by 0.1177%.  $\bar{R}^2$  shows that 24.38% of the change in the volume of arms transfers can be explained by the change in the frequency of war participation.

It should be noted that the frequency of war participation in this context includes only official war engagement. It excludes war participation without an official declaration by the governments of the participants. The limitation of this part is the unavailability of a dataset of unofficial war participation. It is possible that the frequency of unofficial war engagement also influences the volume of arms transfers. This is because unofficial war participation can also demonstrate the performance of weapons, and hence can encourage an increase in the volume of arms transfers.

#### **2.7.4 War participation and the economic situation in arms exporting countries**

This subpart considers the relationship between war participation and economic status or the level of economic growth in arms exporting countries using secondary data from 1989 to 2013, as described in subsection 2.7.1.

According to Table 4 and Table 5, from 1989 to 2013, each of the arms exporting countries, except Brazil, Belarus and North Korea, officially participated in many wars in foreign countries. It is likely that arms exporting countries participate in wars in foreign countries whether they are encountering economic sluggishness or not. Belgium, for instance, participated in wars for 12 years, in 1991, 1999, and from 2004 to 2013. During that period, sometimes Belgium had a low level of economic growth and sometimes it had better levels of economic growth. Precisely, Belgium took part in these wars because of its membership of NATO-which is unaffected by economic factors.

Data presented in Table 4 show that economically-developed arms exporting countries engaged in wars more than economically-developing arms exporting countries. However, some economically-developing arms exporting countries like Ukraine and Uzbekistan, which used to be part of the USSR, also participated in wars frequently. Ukraine engaged in the Iraq and Afghanistan Wars, while Uzbekistan engaged in its domestic war for 3 years, and in the Tajikistan War, one of its neighbors, for 2 years.

According to Table 5, it is likely that long term economic benefit is one of the incentives that persuades many arms exporting countries to engage in wars. It can be seen that many arms exporting countries participated in the Afghanistan Wars, the Iraq War, the Kuwait War and the Balkans War. The incentive for participating in these wars is obvious. Afghanistan is an important country because it is the bridge to Central Asia, an emerging natural resources rich region. Iraq and Kuwait are fuel rich countries. Serbia, however, is not a fuel rich country, the war was about the break-up of Yugoslavia.

## 2.8 Summary

From 1989 to 2013, a large number of arms were transferred to countries around the world. Most of the transferred arms were delivered to economically-developing regions. Arms exporting countries can be separated into two groups; economically-developed arms exporting countries and economically-developing arms exporting countries. The majority of transferred arms were exported from developed countries. The United States was the world largest arms exporting country. While being the biggest arms exporting country, the United States also had the largest share of total world military expenditure between 1989 and 2013. This might be the result of the home market effect.

There were 144 wars in 82 nations between 1989 and 2013. Of these, 27 wars were militarily intervened in by at least one of the 27 arms exporting countries. There are many factors that might cause wars; glory, dynastic interest, statization, natural resources, racial domination, ethnic cleansing, religious differences, strategic acquisition of land, identity, capitalism, etcetera. The pattern of war has changed in several dimensions. Previously, most wars were interstate wars. Nowadays, most wars are intrastate wars that are influenced by a third party. During the Cold War, almost all wars were in the form of proxy wars between the communist nations, led by the USSR, and the democratic nations, led by the United States. After the end of the Cold War era, the United States, the leader of the democratic political systems, became the sole superpower. In addition, some scholars pointed out that the pattern of war changed from Old Wars to New Wars. The Old Wars were mostly wars of nation-state formation and the great power struggles of the twentieth century. They were shorter than the New Wars and were fought with definite aims with the definite purpose of ensuring a sought-after peace settlement and in circumstances where the state had the monopoly of legitimate violence. It is possible to separate war-time from peace-time by means of a treaty or treaties whereas in New Wars, there is no accepted government to ensure these conditions exist and there is no distinct peace as opposed to war condition.

Countries spent a large amount of money on military expenditure. While North America made up approximately 40% of the total world military expenditure between 1989 and 2013, Europe accounted for approximately 30%. The rest of the world



accounted for approximately 20% of the total world military expenditure in this period. It is likely that arms exporting countries spend a lot more of their budget on military expenditure than arms importing countries. In ASEAN, Singapore has been the largest military spender since 1995. Furthermore, the amount of military expenditure of Thailand decreased sharply between 1996 and 2000. Thailand later became the third largest military spender in ASEAN since 2011.

A further finding is that arms exporting countries with high military expenditure participated in wars more frequently. This implies that for arms exporting countries, military expenditure is the indicator of war participation.

It is found that for arms exporting countries, the volume of military expenditure has a significant positive relationship with the volume of arms transfers. This implies that arms exporting countries with a higher volume of military expenditure tend to transfer more arms. However, the result shows that when an arms exporting country increases its military expenditure by 1%, the volume of arms transfers also increases, but by less than 1%. This implies that perhaps the main purpose of increasing military expenditure is not to raise arms transfers. This finding supports the idea that arms exporting countries exports arms to reduce its cost burden.

It is also found that the frequency of war participation of arms exporting countries has a positive relationship with the volume of arms transfers. This means that an arms exporting country that engages in wars more frequently might be able to export more arms. The study result implies that, apart from other reasons regarding foreign policy, one of the incentives for engaging in wars might be to promote arms sales.

The study result reveals that it is likely that arms exporting countries participate in wars in foreign countries whether they are encountering economic sluggishness or not. Furthermore, it seems that economically-developed arms exporting countries engaged in wars more than the economically-developing arms exporting countries. The result also shows that long term economic benefit is one of the incentives that encourage arms exporting countries to engage in wars. This is supported by evidence that many arms

exporting countries participated in the Afghanistan Wars, the Iraq War and the Kuwait War. All of these wars relate to energy resources. In conclusion, perhaps war participation influences both the short term and long term economic benefits of arms exporting countries. In the short term, the more war participation there is, the more arms they can export. In the long term, besides the benefits from the spillover of military technology development, participating in wars might help arms exporting countries in accessing sources of energy.



## **Chapter 3**

### **The Feedback of Military Expenditure and Economic Growth**

#### **3.1 Introduction**

Military expenditure is a crucial issue because it relates to the security framework, the arms trade, wars, and economic growth. There has been a lot of research on military expenditure and its effects on economic growth. However, the results are ambiguous. Therefore, the aims of this chapter are to investigate the relationship between military expenditure and economic growth in three groups of countries; arms and oil importing countries, oil exporting but arms importing countries, and arms exporting countries.

There are seven parts in this chapter. The first part is the introduction. The second part is the literature review. The third part is the limitations. The fourth part examines the relationship between military expenditure and economic growth in arms and oil importing countries. The fifth part analyzes the relationship between military expenditure and economic growth in oil exporting but arms importing countries. The sixth part investigates the feedback on military expenditure and economic growth in arms exporting countries. Finally, the seventh part is a summary.

#### **3.2 Literature review**

##### **3.2.1 Related studies**

The relationship between military expenditure and economic growth is not clear. While some studies indicate that military expenditure has a positive impact on economic growth (Frederiksen and McNab, 2001; Atesoglu, 2002; 2009; Cuaresma and Reitschuler, 2003; Hassan et al., 2003; Halicioğlu, 2004; Heo and Eger III, 2005; Aizenman and Glick, 2006; Kollias et al., 2007; Ageli and Zaidan, 2013), other studies suggest that military expenditure has a negative impact on economic growth (Klein, 2004; Kentor and Kick, 2008; Smith and Tuttle, 2008; Chang et al., 2011; Thada-

Thamrongvech, 2011). Furthermore, some studies conclude that military expenditure has no statistically significant impact on economic growth (Chowdhury, 1991; Kim, 1996).

The main causes of variability in the results of the study on the relationship of military expenditure and economic growth are attributable to the sample selection, time period, and study frameworks (Virunhaphol, 1999; Atesoglu, 2009). Virunhaphol (1999) argued that supply-side models should result in a positive effect of military expenditure on economic growth. On the other hand, analyzing the effect of military expenditure on economic growth using demand-side models should indicate a negative effect. To see the variation in the effect of military expenditure on economic growth, Alptekin and Levine (2012) reviewed 32 empirical studies. They concluded that a negative relationship between military expenditure and economic growth is not supported for both less economically-developed countries and in general, whereas a positive relationship is supported for economically-developed countries. They also concluded that a non-linear relationship between military expenditure and economic growth is confirmed. Moreover, they pointed out that most of the studies that were analyzed used data covering the 1960s, 70s and 80s. It should be noted that these periods were during the Cold War era. Since the world situation has changed due to the end of the Cold War, Alptekin and Levine (2012) suggested that future research should extend the time period to cover the 1990s and onwards. Nonetheless, the purpose of this chapter is to investigate the feedback on military expenditure and economic growth in recent years. Therefore, the study focuses solely on the time period after the end of the Cold War.

### **3.2.2 Related models for analysis**

Several approaches have been used in prior studies to describe the relationship between military expenditure and economic growth. Some of these approaches are production function approaches; the Feder-Ram model, the Solow growth model, and the Barro (1990) growth model. An interest-rate augmented Keynesian approach is also widely used in analysis.

### 1) The Feder-Ram Model

Feder's model (1983; 1986) was initially used to analyze the impact of exports on economic growth in developing countries. It was first adopted by Biswas and Ram (1986) in a cross-country study of the effect of military expenditure and economic growth. Since then, this approach has been employed to study the debate on the military expenditure-growth nexus (Mintz and Stevenson, 1990; Ward and Davis, 1992; Ram, 1995; Antonakis; 1997; Sezgin, 1997; Batchelor et al., 2000; Cuaresma and Reitschuler, 2003; Heo and Eger III, 2005). The two-sector version of the Feder-Ram model has two distinguishable output; civilian output (*Civ*) and military output (*Mil*). Domestic output (*Y*) is presented in Equation (5).

$$Y = Civ + Mil \quad (5)$$

In the Feder-Ram model, the values of the marginal product of labor;  $Mil_L$ ,  $Civ_L$ , and capital;  $Mil_K$ ,  $Civ_K$ , can be differentiated across sectors. Equation (6) shows a constant uniform proportion of the difference.

$$\frac{Mil_L}{Civ_L} = \frac{Mil_K}{Civ_K} = 1 + \mu. \quad (6)$$

Ultimately, the Feder-Ram growth equation is as equation (7).

$$\hat{Y} = \frac{Civ_L}{Y} \hat{L} + Civ_K \frac{I}{Y} + \left( \frac{\mu}{1+\mu} - \theta \right) \frac{Mil}{Y} \widehat{Mil} + \theta \widehat{Mil} \quad (7)$$

The following is a regression form of the Feder-Ram model.

$$\hat{Y} = \beta_1 \hat{L} + \beta_2 \frac{I}{Y} + \beta_3 \frac{Mil}{Y} \widehat{Mil} + \beta_4 \widehat{Mil} + \varepsilon \quad (8)$$

Equation (8) indicates a relationship between military expenditure and output. However, Dunne et al. (2005) criticized the Feder model stating that it is prone to theoretical misinterpretation as well as econometric estimation problems. Misinterpretation

comes from Equation (6), which shows the marginal factor productivity differential between sectors. The interpretation of a non-zero  $\mu$  indicates that one sector is less efficient in its factor use than another. However, the two-sector Feder-Ram model imposes uniformity of the factor productivity differential for both factors. In other words, in this model, the economy is assumed to produce on the efficiency frontier of the production possibility set. Therefore, the statement that a non-zero  $\mu$  measures the presence of some sort of sector-specific inefficiency in the use of resources is flawed.

According to Dunne et al. (2005), Equations (7) and (8) show a number of econometric problems in estimating the Feder-Ram model. For instance, the model treats capital and labor asymmetrically. It is not clear why  $Civ_L/Y$  should be considered as a constant  $\beta_1$ , whereas  $Civ_K/Y$  should be split into a parameter and a variable,  $\beta_2 I/Y$ . Furthermore, it is also not clear as to where the errors come from.

Additionally, there are simultaneity and multicollinearity problems. Employing the growth rate of military expenditure as a variable on the right-hand side of the equation leads to the simultaneity problem. This is because if the share of military is constant, variations in the growth in output will determine the growth of military expenditure. In addition, multicollinearity between the last two terms of the growth equation may lead to significant standard errors and inaccurate estimates of the externality parameter.

Another point is that the Feder-Ram model is static. It is known that initial income is typically a determinant of growth. However, there is no lagged dependent or independent variables in the model. Furthermore, as the rates of growth in Equations (7) and (8) show, there are few variables that influence the growth of output.

Therefore, according to Dunne et al. (2005), the Feder-Ram model should not be used to examine the impacts of military expenditure on economic growth.

## 2) The augmented Solow model

The basic Solow-Swan's (1956) growth model is a neoclassical exogenous growth model. In this model, technological improvements are automatic and exogenous, and it is the engine of growth. An augmented Solow growth model was then introduced by Mankiw et al. (1992). The model includes the accumulation of human and physical capital. As a result, the model provides a better description of cross-country variation in terms of per worker GDP. The augmented Solow growth model was firstly used to measure the effect of military expenditure on growth by Knight et al. (1996). The key assumption was that the share of military spending in GDP affects factor productivity via a leveling effect on the technology parameter.

The augmented Solow model starts with an aggregate neoclassical production function and the equation of the technology parameter is as shown in Equations (9) and (10).

$$Y_t = k_t^\alpha [A_t L_t]^{1-\alpha} \quad (9)$$

$$A_t = A_0 e^{gt} m_t^\theta \quad (10)$$

where  $Y$  is aggregate real income,  $K$  is real capital stock,  $L$  is labor,  $A$  is the technology parameter,  $g$  is the exogenous rate of technological progress,  $m$  is the share of military expenditure in GDP, and  $t$  is the time period. Together with the standard Solow model assumptions involving an exogenous saving rate  $s$ , a constant labor growth rate  $n$ , and a rate of capital depreciation  $d$ , and the dynamics of capital accumulation, the equation for cross-section is as shown in Equation (11).

$$\Delta \ln y_t = \beta_0 + \beta_1 \ln y_{t-1} + \beta_2 \ln s_t + \beta_3 \ln(n_t + g_t + d_t) + \beta_4 \ln m_t + \beta_5 \ln m_{t-1} + \varepsilon_t \quad (11)$$

The dependent variable in this model is the growth rate. Different from the Feder model, this model is a one-sector model rather than a two-sector model. It is assumed that there is only a single good produced. Military expenditure influences output in a rather ad hoc way.

According to Dunne et al. (2005), the strengths of this model are that it is tight, and no explicit incorrect specifications or econometric problems have been found. However, since the model is so tight, the Solow model excludes a range of other important variables. Furthermore, Atesoglu (2009) added that it is difficult to apply the Solow model for a particular country because it is difficult to find the reliable time series data required for crucial variables, and the results obtained are not easy to interpret.

### 3) The Barro growth model

The Barro's (1990) growth model is an extended endogenous economic growth model. In contrast to neoclassical exogenous growth models, endogenous economic growth models try to explain the engine of growth. The Barro growth model adds government expenditure to the AK growth model. It starts with the utility function. The representative infinite-lived household in a closed economy maximizes its utility by choosing the amount of consumption.

$$U(c) = \int_0^{\infty} e^{-\rho t} u(c) dt, \quad (12)$$

where  $c$  is consumption per person,  $\rho > 0$  is the constant rate of time preference, and  $t$  is time period. Here, population, which corresponds to the number of workers and consumers, is assumed to be constant. The utility function is as follows:

$$u(c) = \frac{c^{1-\sigma} - 1}{1-\sigma} \quad (13)$$

where  $\sigma > 0$ . Thus, the marginal utility has the constant elasticity,  $-\sigma$ .

It is assumed that a representative agent produces a single commodity using a production function by the private capital stock,  $k$ . Thus, each producer has the following production function.

$$y = f(k) \quad (14)$$



where  $y$  is output per worker,  $f$  is a production function, and  $k$  is capital per worker. In this analysis, Barro (1990) assumed constant returns to a broad concept of private capital stock. Therefore,

$$y = Ak \quad (15)$$

where  $A > 0$  is the exogenous rate of technology and is the constant net marginal product of capital. Each worker works a given amount of time. In addition, it is assumed that the private capital grows as in the following model.

$$\dot{k} = (1 - \tau)y - c \quad (16)$$

where  $\dot{k}$  is the growth of private capital stock,  $\tau$  is the rate of income tax, and  $c$  is consumption.

The agent chooses the amount of consumption to maximize the flow of future utility function in Equation (12) subject to the growth of private capital stock in Equation (16). The optimal growth rate of consumption at each point in time ( $\gamma$ ) is shown as the following.

$$\gamma = \frac{\dot{c}}{c} = \frac{1}{\sigma}(f' - \rho) \quad (17)$$

where  $\gamma$  denotes a per capita growth rate and  $f'$  is the marginal product of capital. Substituting  $f'$  into Equation (17), yields

$$\gamma = \frac{\dot{c}}{c} = \frac{1}{\sigma}(A - \rho) \quad (18)$$

where  $A > 0$  is the constant net marginal product of capital.

Barro (1990) assumed that the technology,  $A$ , is sufficiently productive to ensure positive steady-state growth although not enough to yield unbounded utility. Consequently, the corresponding inequality conditions are as follows.

$$A > \rho > A(1 - \sigma). \quad (19)$$

$A > \rho$  implies that the growth rate of consumption in Equation (18) is positive,  $\gamma > 0$ . Whereas  $\rho > A(1 - \sigma)$ , which is satisfied if  $A > 0$ ,  $\rho > 0$ , and  $\sigma \geq 1$ , implies that the utility is bounded.

Barro (1990) modified the analysis by adding government expenditure into the model.  $g$  denotes the quantity of government expenditure, or public services, provided to each producer. Government expenditure is considered as an input to private production. It, therefore, may have a possible effect on growth. Here, these services are assumed to be provided without user charges. Furthermore, they are assumed not to be subject to congestion effects, which might be caused by highways or other public services.

The assumption of the Barro (1990)'s production function is that it has constant returns to scale in the private capital stock,  $k$ , and government expenditure,  $g$ , together but diminishing returns to scale in  $k$  separately. In this sense, even though there are constant returns to scale in the broad concept of private capital stock, the production exhibits decreasing returns to the private capital if government expenditure does not increase in a parallel manner with the private capital stock. This is because the private capital stock and government expenditure are complementary. Given constant returns to scale, the production function can be written as follows:

$$y = \phi(k, g) \quad (20)$$

where  $\phi$  satisfies the conditions for positive and diminishing marginal products,  $\phi' > 0$ , and  $\phi'' < 0$ . Holding  $g$  constant, the marginal product of capital is as follows:

$$\frac{\partial y}{\partial k} = \phi\left(\frac{g}{k}\right) \cdot \left(1 - \phi' \cdot \frac{g}{y}\right) = \phi\left(\frac{g}{k}\right) \cdot (1 - \eta) \quad (21)$$

where  $\eta$  is the elasticity of  $y$  with respect to  $g$  for a given value of  $k$ . Therefore  $0 < \eta < 1$ .

Assuming the Cobb-Douglas production function, it yields

$$y = Ag^\alpha k^{1-\alpha} = k \cdot A \left(\frac{g}{k}\right)^\alpha \quad (22)$$

where  $0 < \alpha < 1$ .

Barro (1990) assumed that government expenditure is financed by a flat-rate income tax. Hence, the amount of government expenditure is determined by the amount of taxes collected from the private sector.

$$g = T = \tau y = \tau \cdot k \cdot \phi\left(\frac{g}{k}\right) \quad (23)$$

where  $T$  denotes government revenue and  $\tau$  is the flat-rate income tax. It should be noted that, in this model, the government runs a balanced budget. The government can neither run surpluses by accumulating assets nor run deficits by issuing public debt.

The agent's maximization leads to the following growth rate.

$$\gamma = \frac{\dot{c}}{c} = \frac{1}{\sigma} \cdot [(1 - \tau) \cdot \phi' \cdot \left(\frac{g}{k}\right) - \rho]. \quad (24)$$

Equation (24) can be written as the following:

$$\gamma = \frac{\dot{c}}{c} = \frac{1}{\sigma} \cdot [(1 - \tau) \cdot \phi\left(\frac{g}{k}\right) \cdot (1 - \eta) - \rho] \quad (25)$$

where  $\eta$  is the elasticity of  $\gamma$  with respect to  $g$ , given value of  $k$ . Thus,  $0 < \eta < 1$ . As long as  $\tau$  or  $\frac{g}{k}$  are constants,  $\frac{g}{k}$ ,  $\eta$ , and therefore  $\gamma$  will be constant.

From Equation (25), different values of  $\tau$  and  $\frac{g}{k}$  have two effects on the growth rate. While an increase in  $\tau$  reduces the growth rate, an increase in  $\frac{g}{k}$  increases  $\frac{\partial \gamma}{\partial k}$ , which

increases the growth rate. Typically, the first case dominates when government expenditure is large, and the second case dominates when government expenditure is small.

In the case of a simple Cobb-Douglas production function, the elasticity of  $y$  with respect to  $g$  is constant. In this case,  $\eta = \alpha$ . The conditions  $\tau = \frac{g}{y}$ , and  $\frac{g}{k} = \frac{g}{y} \cdot \phi \frac{g}{k}$  imply that the derivative of  $\gamma$  with respect to  $\frac{g}{y}$  is as the following equation.

$$\frac{d\gamma}{d(\frac{g}{y})} = \frac{1}{\sigma} \cdot \phi \left(\frac{g}{k}\right) \cdot (\phi' - 1). \quad (26)$$

Therefore, the growth rate increases with  $\frac{g}{y}$  if  $\frac{g}{k}$  is small enough such that  $\phi' > 1$ . On the other hand, the growth rate declines with  $\frac{g}{y}$  if  $\frac{g}{k}$  is large enough such that  $\phi' < 1$ . In the Cobb-Douglas production function, the optimal size of government expenditure,  $\frac{g}{y}$ , that maximizes the growth rate corresponds to the condition for productive efficiency, that is  $\phi' = 1$ . Since  $\alpha = \eta = \phi' \cdot \left(\frac{g}{y}\right)$ , consequently  $\alpha = \frac{g}{y} = \tau$ . That is, in order to maximize the growth rate, the share of government expenditure in output,  $\frac{g}{y}$ , will be set to equal the rate of income tax if the public services were competitively supplied as an input of production.

This basic Barro (1990) model has spurred a number of developments. Military expenditure can be introduced by extending Equation (22) as follows:

$$y = \Psi(k, g_1, g_2) = Ak^{1-\alpha-\beta} g_1^\alpha g_2^\beta \quad (27)$$

where  $0 < \alpha, \beta < 1$ ,  $k$  is the private capital stock,  $g_1$  is military expenditure, and  $g_2$  is non-military government expenditure.

Employing Equation (27) in place of Equation (16), the growth of private capital is as follows.

$$\dot{k} = (1 - \tau)Ak^{1-\alpha-\beta}g_1^\alpha g_2^\beta - c. \quad (28)$$

The government expenditure constraint is determined by the amount of taxes collected from the private sector:

$$g = g_1 + g_2 = \tau y. \quad (29)$$

Take  $\varphi$  and  $1-\varphi$  as the fraction of resources allocated to military expenditure and non-military expenditure, respectively, i.e.,  $\varphi$  is the share of military government expenditure. The flows of government expenditure are allocated by using the following rules.

$$g_1 = \varphi \tau y \quad (30)$$

$$g_2 = (1 - \varphi) \tau y \quad (31)$$

A representative household chooses the optimal amount of private consumption. By solving the model, the steady-state growth rate can be written as follows:

$$\gamma = [(1 - \alpha - \beta)(1 - \tau)\varphi^\alpha(1 - \varphi)^\beta A \left(\frac{g_1 + g_2}{k}\right)^{\alpha+\beta} - \rho]. \quad (32)$$

Rearranging Equation (32) in terms of  $\varphi$ , yields the following equation.

$$\gamma = [(1 - \alpha - \beta)(1 - \tau)\varphi^\alpha(1 - \varphi)^\beta A((\tau A \varphi^\alpha(1 - \varphi)^\beta)^{1-\alpha-\beta})^{\alpha+\beta} - \rho] \quad (33)$$

Differentiating Equation (33) with respect to  $\varphi$ , the result can be written as follows:

$$\frac{\partial \gamma}{\partial \varphi} = \frac{1}{\theta} \left[ \left( \frac{\alpha}{\varphi} - \frac{\beta}{(1-\varphi)} \right) (1 - \alpha - \beta) (1 - \tau) \tau^{\frac{\alpha+\beta}{1-\alpha-\beta}} \varphi^{\frac{\alpha}{1-\alpha-\beta}} (1 - \varphi)^{\frac{\beta}{1-\alpha-\beta}} A^{\frac{1}{1-\alpha-\beta}} \right] \quad (34)$$

From Equation (34), the sign of the impact of the military expenditure on the growth rate can be predicted as follows:

$$\begin{aligned} \text{If } \frac{\alpha}{\varphi} < \frac{\beta}{1-\varphi}, \text{ then } \frac{d\gamma}{d\varphi} < 0, \text{ and} \\ \text{if } \frac{\alpha}{\varphi} > \frac{\beta}{1-\varphi}, \text{ then } \frac{d\gamma}{d\varphi} < 0. \end{aligned} \quad (35)$$

This implies that the impact of military expenditure on the growth rate depends on the productivity parameter of the share of military expenditure in total government expenditure. That is, if the share of military expenditure is higher than its optimal level, military expenditure has a negative impact on the growth rate.

In conclusion, Barro (1990) introduced government expenditure as a public good into the production function. Government expenditure makes the rate of return to private capital increase, which stimulates private investment and ultimately the rate of economic growth. Military expenditure is distinguished from non-military government expenditure. It is assumed that military expenditure may directly and indirectly affect economic growth. The impact of military expenditure on the rate of economic growth depends on its productivity. If the share of military expenditure is higher than its optimal level, military expenditure has a negative impact on the rate of economic growth. In addition to, military expenditure, other variables are also included in Barro's (1990) growth model. The following is the Barro-style regression.

$$\gamma_{it} = \beta_0 + \beta_1 \gamma_{it-1} + \beta_2 s_{it} + \beta_3 \text{popg}_{it} + \beta_4 \text{educ}_{it} + \beta_5 m_{it} + \varepsilon_{it} \quad (36)$$

where  $\gamma$  denotes the rate of economic growth, traditional variables which are the log of initial per capita GDP ( $y$ ), the share of investment in GDP ( $s$ ), the rate of population growth ( $\text{popg}$ ), and the log of average years of schooling ( $\text{educ}$ ), which represents human capital, are included in the regression in addition to the share of military expenditure in GDP ( $m$ ). Other control variables, such as institutional, demographic, geographic characteristics and the interaction between military expenditure and threats or corruption or arms exports, might be included in the regression.

According to Dunne et al. (2005), the Barro (1990) growth model is suitable for analyzing cross-countries concerning the defense-growth nexus. The Barro growth model provides essential theoretical and econometric reasons for estimating simultaneous systems that explain both military expenditure and output. However, this chapter aims to analyze the causality between economic growth and the share of military expenditure; therefore the variable of interest “the share of military expenditure” is replaced by “the lagged share of military expenditure”.

#### 4) Interest-rate augmented Keynesian Model

The advantage of the interest-rate augmented Keynesian model is that it relies on a familiar and simple macroeconomic model. While assessing the effect of military expenditure, it explicitly accounts for the effect of the monetary sector through investment as shown in Equation (37).

$$Y_{it} = C_{it} + I_{it} + \tilde{G}_{it} + Mil_{it} + X_{it}, \quad i = 1, \dots, n \quad (37)$$

where  $Y_{it}$ ,  $C_{it}$ ,  $I_{it}$ ,  $\tilde{G}_{it}$ ,  $Mil_{it}$ , and  $X_{it}$  are real output, real consumption spending, real investment, real non-military government expenditure, real military expenditure, and real net exports of country  $i$  at year  $t$ , respectively.

As usual, the real consumption spending of a country is defined as some level of autonomous consumption ( $\gamma_0$ ) plus the marginal propensity to consume ( $\gamma_1$ ) times disposable income.

$$C_{it} = \gamma_0 + \gamma_1(Y_{it} - T_{it}) \quad (38)$$

$T$  is defined as real tax of net arms. The real tax is determined by real output.

$$T_{it} = \gamma_2 + \gamma_3 Y_{it} \quad (39)$$

In this model, the real interest rate has a negative effect on investment. That is, if the real interest rate ( $R$ ) in year  $t$  increases the level of investment in year,  $t$  decreases.

$$I_{it} = \zeta_0 - \zeta_1 R_{it} \quad (40)$$

It is conjectured that real net exports is a negative function of real output and real interest rates.

$$X_{it} = \theta_0 - \theta_1 R_{it} - \theta_2 Y_{it} \quad (41)$$

Combining all of the above equations, the reduced form solution, including a stochastic error term, is:

$$Y_{it} = \alpha_0 - \alpha_1 R_{it} + \alpha_2 Mil_{it} + \alpha_3 \tilde{G}_{it} + v_{it} \quad (42)$$

where  $\alpha_0 = (\gamma_0 - \gamma_1 \gamma_2 + \zeta_0 + \theta_0) / (1 - \gamma_1 + \gamma_1 \gamma_3 + \theta_2)$

$$\alpha_1 = (\zeta_1 + \theta_1) / (1 - \gamma_1 + \gamma_1 \gamma_3 + \theta_2)$$

$$\alpha_2 = 1 / (1 - \gamma_1 + \gamma_1 \gamma_3 + \theta_2)$$

$$\alpha_3 = 1 / (1 - \gamma_1 + \gamma_1 \gamma_3 + \theta_2)$$

To the best of the author's knowledge, the Keynesian approach also has no statistical or theoretical economic problems. It provides variables which are in accordance with economic theories. However, this model excludes the variables of interest like population growth and capital accumulation. Therefore, this model is not chosen to analyze the impacts of military expenditure on economic growth.

It can be seen that each model has its own advantages and disadvantages. They also have specific characteristics that are suitable for different types of data. Table 9 shows the conclusion for each model.



Table 9 Advantages and disadvantages of each approach

Model	Weakness			Type of data
	Theoretical problem	Statistics problem	Lack of independent variables	
The Feder approach	X	X		cross-countries and specific country data
The augmented Solow model			X	cross-countries data
The Barro growth model				cross-countries data
The Keynesian approach				specific country data

According to Table 9, both Barro's growth model and the interest-rate augmented Keynesian approach have no economic theoretical and statistical problems. This thesis, however, does not adopt the whole sets of the Barro growth model or the Keynesian approach. The whole set of the Barro is not chosen because this thesis aims to analyze the causality between economic growth and the share of military expenditure; therefore, the share of military expenditure is replaced by the lagged share of military expenditure. In addition, since the Keynesian approach excludes the variables of interest like population growth and capital accumulation, it is not chosen to analyze the impacts of military expenditure on economic growth. This chapter utilizes the advantages of a panel vector autoregressive (panel VAR) analysis. Using this technique, the explanatory variables are driven by the data. Nonetheless, the variables included in this model are based on the Barro growth model.

### 3.2.3 Related statistical tests for the analysis

#### 1) Vector Autoregressive (VAR) and Panel Vector Autoregressive (Panel VAR) models

##### 1.1) Vector Autoregressive (VAR) model

VAR models have been used to investigate the relationship between economic variables, especially macroeconomic variables ((Sims 1980); (Blanchard and Quah

1989); (Galí 1999); (Blanchard and Perotti 2002); (Sims and Zha 2005); Vidangos, 2009; Chauvet, 2012). A VAR model is an equation, n-variable, together with current and past values of the remaining n-1 variables. On the other hand, all variables in a VAR model are assumed to be endogenous and interdependent, both in a dynamic and in a static sense. In some cases, according to Ramey and Shapiro (1998), exogenous variables could be included in the model.

VAR models, besides assuming linearity, stationarity and invertibility of the resulting moving average representation, use the Wold decomposition theorem (Canova and Matteo, 2013). Wold's theorem states that any covariance stationary process can be decomposed into two mutually uncorrelated component processes. One is a linear combination of lag of a white noise process. The other is a process where the future values of which can be predicted exactly by some linear function of past observations (Canova, 2007). Because of its simple framework, it provides a systematic way to capture dynamics in multiple time series. It is a useful model for describing the dynamic behavior of economic time series. According to Stock and Watson (2001), based on economic reasoning and institutional detail, VARs both can fit the data and can provide sensible estimates of some causal connections.

There are three forms of VAR model. The first form is reduced VAR, the second form is recursive VAR, and the third form is structural VAR.

A reduced VAR describes each variable as a linear function of its own lagged values, the lagged values of other variables being considered and a serially uncorrelated error term. In a VAR model, lags of all dependent variables create the feature of dynamic interdependencies, whereas the error term creates the feature of static interdependencies. The lagged values to include in each equation can be determined by many different methods, such as the Akaike information criteria (AIC) and Bayes information criteria (BIC). The error terms in the regression equations are assumed to be serially uncorrelated error terms. A sample of the bivariate 1-lag reduced form vector autoregressive VAR(1) model equation by equation can be presented as the following:

$$Y_t = c_{10} + \gamma_{11}Y_{t-1} + \gamma_{12}Z_{t-1} + \varepsilon_{yt} \quad \varepsilon_{yt} \sim iid(0, \Sigma \varepsilon_{yt}) \quad (43)$$

$$Z_t = c_{20} + \gamma_{21}Y_{t-1} + \gamma_{22}Z_{t-1} + \varepsilon_{zt} \quad \varepsilon_{zt} \sim iid(0, \Sigma \varepsilon_{zt}) \quad (44)$$

where  $Y_t$  and  $Z_t$  are dependent variables,  $Y_{t-1}$  and  $Z_{t-1}$  are independent variables,  $c_{10}$  and  $c_{20}$  are constants,  $\gamma_{11}$ ,  $\gamma_{12}$ ,  $\gamma_{21}$ , and  $\gamma_{22}$  are coefficients. Furthermore,  $\varepsilon_{yt}$  and  $\varepsilon_{zt}$  are unobservable zero mean white noise. Additionally,  $t = 1, \dots, T$  represents the time period.

A recursive VAR differs from a reduced VAR as it includes the current value of some variables as regressors. Consequently, the error term in each regression equation is uncorrelated with the error in the preceding equations. The sample of a bivariate 1-lag recursive VAR(1) model can be presented as the following.

$$Y_t = c_{10} + \gamma_{11}Y_{t-1} + \gamma_{12}Z_{t-1} + \gamma_{13}W_t + \gamma_{14}X_t + \varepsilon_{yt} \quad (45)$$

$$Z_t = c_{20} + \gamma_{21}Y_{t-1} + \gamma_{22}Z_{t-1} + \varepsilon_{zt}. \quad (46)$$

Structural VAR allows the contemporaneous links between the variables (Stock and Watson, 2001; Pedroni, 2013). The system requires the identifying assumptions that allow correlations between variables to be interpreted causally. The identifying assumptions can involve the entire system or just a single equation. In this system, instrumental variables are used in order to permit the linkage between variables. One more thing that differentiates structural VARs and recursive VARs is that while recursive VARs use an arbitrary mechanical method to model contemporaneous correlation in the variables, structural VARs use economic theory to associate these correlations with causal relationships.

## 1.2) Panel Vector Autoregressive (Panel VAR) model

Panel VAR models are extended time series VAR models. They are built with the same logic as VAR models. However, a cross sectional dimension is added. According to Canova and Matteo (2013), panel VARs have several advantages. Firstly, they are able to capture both static and dynamic interdependencies. Secondly, they treat the links across series in an unrestricted fashion. Thirdly, they easily incorporate time variations in the coefficients and in the variance of the shocks. Fourthly, they account for cross sectional dynamic heterogeneities.

A sample of typical bivariate 1-lag recursive panel VAR(1) model can be presented as the following.

$$Y_{it} = c_{10i} + \gamma_{11}Y_{it-1} + \gamma_{12}Z_{it-1} + \gamma_{13}W_{it} + \gamma_{14}X_{it} + \varepsilon_{yit} \quad \varepsilon_{yit} \sim iid(0, \Sigma \varepsilon_{yit}) \quad (47)$$

$$Z_{it} = c_{20i} + \gamma_{21}Y_{it-1} + \gamma_{22}Z_{it-1} + \varepsilon_{zit} \quad \varepsilon_{zit} \sim iid(0, \Sigma \varepsilon_{zit}) \quad (48)$$

where, again,  $Y_t$  and  $Z_t$  are dependent variables,  $Y_{t-1}$ ,  $Z_{t-1}$ ,  $W_{it}$  and  $X_{it}$  are independent variables,  $c_{10}$  and  $c_{20}$  are constants,  $\gamma_{11}$ ,  $\gamma_{12}$ ,  $\gamma_{13}$ ,  $\gamma_{14}$ ,  $\gamma_{21}$ , and  $\gamma_{22}$  are coefficients.  $\varepsilon_{yt}$  and  $\varepsilon_{zt}$  are unobservable zero mean white noise.  $t = 1, \dots, T$  represent the time period. And,  $i = 1, \dots, N$  represent the number of panels.

From Equations (47) and (48), as pointed out by Canova and Ciccarelli (2013), a panel VAR model possesses the features of dynamic interdependencies, static interdependencies and cross sectional heterogeneity. The feature of dynamic interdependencies comes from lags of all endogenous variables of all series entering the model for unit  $i$ . Furthermore, the feature of static interdependences comes from the correlations of the shocks ( $\varepsilon$ ) across  $i$ . In addition, the feature of cross sectional heterogeneity may emerge since the intercept, the slope and the variance of the shocks ( $\varepsilon_{it}$ ) may be unit specific.

## 2) Panel Unit root test

There are several reasons why non-stationarity is needed to be tested for all variables before running the regression model. The first reason is that if the variables in the regression model are not stationary, the standard assumptions for asymptotic analysis will not be valid. Hence, hypothesis tests about the regression parameters are not able to be undertaken accurately because the  $t$ -ratios will not follow a  $t$ -distribution. The second reason is spurious regression. Suppose there are two variables and they are trending over time. Even though the two variables are totally unrelated, a regression of one on the other could have a high  $R^2$ . The third reason is persistence of shocks. If the series of variables is a nonstationary series, persistence of shocks will be infinite.

### 2.1) Types of non-stationarity

There are many forms of non-stationarity. However, there are two models which have been frequently used to characterize non-stationarity. The first model is the random walk model with drift. This model is also known as stochastic non-stationarity. We can induce stationarity by differencing. The second model is a deterministic trend model. This model is known as deterministic non-stationarity. We can induce stationarity by detrending. Assuming an AR(1), the random walk model with drift and the deterministic trend model are shown as Equations (49) and (50), respectively.

$$Y_{it} = \rho_i + Y_{it-1} + v_{it} \quad v_{it} \sim iid(0, \Sigma v_{it}) \quad (49)$$

$$Y_{it} = \varphi_i + \theta_{it} + v_{it} \quad v_{it} \sim iid(0, \Sigma v_{it}) \quad (50)$$

In order to transform Equation (49) to a stationary process, subtract  $Y_{it-1}$  from both sides of Equation (49), we get

$$Y_{it} - Y_{it-1} = \rho_i + v_{it} \quad (51)$$

Now we have induced stationarity by differencing once. The process becomes difference-stationary. However, the disadvantage of differencing is that the process loses one observation each time the difference is taken.

To transform Equation (50) to a stationary process, subtract the trend ( $\theta_{it}$ ) from both sides of Equation (50). Consequently, we get a stationary process as follows.

$$Y_{it} - \theta_{it} = \varphi_i + v_{it}. \quad (52)$$

As can be seen, no observation is lost when we transform a deterministic trend model by subtracting the trend. Nonetheless, although both stochastic non-stationarity and deterministic non-stationarity are trending over time, we need to use the right method to induce stationarity. If we difference the deterministic non-stationary series, it would remove the non-stationarity, but at the expense of introducing an MA structure to the errors. In contrast, if we try to detrend a stochastic non-stationary series, then we will not remove the non-stationarity.

## 2.2) Panel unit root test

This part employs the panel unit root test which was developed by Maddala and Wu (1999). Unlike other tests such as Levin-Lin-Chu (LLC) (2002), Harris-Tzavalis (HT) (1999) and Breitung (2000), the Maddala and Wu test does not require a balanced panel, so time can differ over cross sections.

The Maddala and Wu test is a Fisher-type test. It follows the Fisher test by combining the  $p$ -values from  $N$  independent unit root tests. Based on the  $p$ -values of individual unit root tests, the null hypothesis is that all series are non-stationary against the alternative hypothesis where at least one series in the panel is stationary. To compute Maddala and Wu (1999), we firstly conduct the Augmented Dickey-Fuller (1979) or ADF unit root test for each country. After that, we calculate the test using the given Equation (53).

$$\lambda = -2 \sum_{i=1}^N \ln(p_i) \sim \chi^2(2N) \quad (53)$$

where  $p_i$  are the probability values of the ADF(1) test with constant but without trend for individual variables and countries. They are MacKinnon approximate  $p$ -value for the  $Z$  test. Probabilities that equal 0.0000 are adjusted to be 0.0001 in order to enable

calculation of  $p_i$ . Maddala and Wu's (1999) panel unit root test statistic follows a  $\chi^2$  with  $2N$  degree of freedom.

### 3.3 Limitation

This chapter uses a panel vector autoregressive. The variables in the model are based on the Barro growth model. The Barro-style regression model is presented in Equation (36).

$$\gamma_{it} = \beta_0 + \beta_1 y_{it-1} + \beta_2 s_{it} + \beta_3 popg_{it} + \beta_4 educ_{it} + \beta_5 m_{it} + \varepsilon_{it} \quad (36)$$

According to Equation (36), the traditional explanatory variables are GDP, share of investment in GDP, population growth, average years of schooling, which is the proxy of human resources, and the share of military expenditure in GDP. However, there is a limitation about the average years of schooling. Some of the underlying countries do not have datasets of educational attainment (Barro and Lee, 2010). Therefore, the models used in this thesis exclude this variable.

### 3.4 Military expenditure and economic growth in arms and oil importing countries

#### 3.4.1 Motivation and objective

The aim of this part is to examine the relationship between military expenditure and economic growth in 94 arms and oil importing countries using unbalanced panel data over the time period from 1992 to 2013. The motivation for focusing on arms importing countries is based on their specific characteristics and the purposes of military expenditure. They have neither large defense industries nor oil industries. They import arms mainly for the domestic security framework, neither for supporting defense industry nor protecting oil stocks. The impacts of military expenditure of arms importing countries might influence economic growth in their own countries, as well as benefiting arms industries in arms exporting countries. In addition, although Alptekin and Levine (2012) concluded that the hypothesis of a negative military expenditure-growth relationship is not supported, they found that most of

the studies that were analyzed used the time period of data covering only the 1960s, 1970s and 1980s. This part, therefore, focuses on arms importing countries using data for the time period from 1989 to 2013, when the perceived threat is reduced across nations because of the end of the Cold War. It is conjectured that an increase in the share of military spending leads to a decrease in economic growth.

### 3.4.2 Methodology

This section employs panel data from 94 arms and oil importing countries. As previously stated, according to Dunne and Perlo-Freeman (2003), panel data techniques have several advantages compared to other techniques. They offer a better framework for statistical inference. The most important feature of panel data is that they can be applied to measure the individual changes in a set of variables directly. This section employs recursive VAR models because, according to Finkel (1995), they are suitable for causality analysis. In these models, the lagged value and a series of independent variables, as well as a serially uncorrelated error term, are used as independent variables.

To formulate the model to investigate the relationship between military expenditure and economic growth in arms and oil importing countries, this section applies the Barro growth model to specify the variables.  $GDP_{it}$  denotes the real GDP of country  $i$  at time  $t$ ,  $Mil_{it}$  denotes a share of military expenditure in GDP of country  $i$  at time  $t$ ,  $Pop_{it}$  denotes the number of population of country  $i$  at time  $t$ , and  $Inv_{it}$  denotes the share of investment in GDP of country  $i$  at time  $t$ . Then, take the natural log of  $GDP_{it}$  and  $Pop_{it}$ . Let  $\varepsilon_{yit}$ , and  $\varepsilon_{milit}$  to be error terms which are assumed to be serially uncorrelated error terms. After that, set the differentiated forms of the natural log of GDP and the natural log of population. In this thesis, the share of investment in GDP is a proxy for capital good, and the population growth is a proxy for labor input. Because of data limitations, the time dimension of the panel is not large. This section therefore considers a maximum of 2 lags and lagged values to be included in each equation. The lagged length to include in each equation can be determined by many different methods, such as the Akaike information criterion (AIC), the Schwarz information criterion, the Bayes information criteria (BIC), and the Hannan and Quinn criterion (HQC). In this part, the lagged length is selected by the AIC criterion. Given



that the common optimal lag length is 1, the relationship between military expenditure and economic growth can take the following form:

$$\Delta \ln GDP_{it} = \alpha_0 + \alpha_1 \Delta \ln GDP_{it-1} + \alpha_2 Mil_{it-1} + \alpha_3 Inv_{it} + \alpha_4 \Delta \ln Pop_{it} + \varepsilon_{yit} \quad (54)$$

$$Mil_{it} = \beta_0 + \beta_1 \Delta \ln GDP_{it-1} + \beta_2 Mil_{it-1} + \beta_3 Inv_{it} + \beta_4 \Delta \ln Pop_{it} + \varepsilon_{milit} \quad (55)$$

where  $GDP_{it}$  = real GDP of country  $i$  at time  $t$  (unit: local currency)

$Mil_{it}$  = a share of military expenditure in GDP of country  $i$  at time  $t$  (unit: %)

$Inv_{it}$  = the share of investment in GDP of country  $i$  at time  $t$  (unit: %)

$Pop_{it}$  = Number of population of country  $i$  at time  $t$  (unit: persons)

$\alpha_0, \beta_0$  = constant

$\alpha_1, \alpha_2, \alpha_3, \alpha_4, \beta_1, \beta_2, \beta_3,$  and  $\beta_4$  = coefficients

$\varepsilon$  = error term

$i$  = 94 arms and oil importing countries

$t$  = 1992, ..., 2013 (It should be noted that the panel data in this part are unbalanced because the data of some countries are not available in some periods of time.).

According to Kollias at al. (2007), the presence of the lagged values of  $\Delta \ln GDP_{it}$  and  $Mil_{it}$  allow us to analyze explicitly the changes in  $\Delta \ln GDP_{it}$  and  $Mil_{it}$  over time. If the study result shows that the lagged variable of  $Mil_{it}$  is associated with changes in  $\Delta \ln GDP_{it}$ , this would represent more direct evidence of a causal effect from  $Mil_{it}$  to  $\Delta \ln GDP_{it}$  than is possible to obtain in static cross-sectional designs. However, the lagged independent variables  $\Delta \ln GDP_{it}$  in Equation (54) and  $Mil_{it}$  in Equation (55) are correlated with the error terms (Anderson and Hsiao, 1982). According to Nickell (1981) this bias approaches zero as the time dimension (T) is large. Since the time dimension is not large, the problem of the biased estimator must be rectified. Therefore, instrument variables are used to deal with this problem (Anderson and Hsiao, 1982).  $\Delta \ln GDP_{it-2}$  and  $Mil_{it-2}$  are used as instrumental variables for  $\Delta \ln GDP_{it-1}$  and  $Mil_{it-1}$ ,

respectively. After the adjustment, i.e. using the instrument variables, there are 1,403 observations for investigation.

Data are obtained from various sources. Nominal Gross Domestic Product, share of government spending, share of investment, inflation rate and number of population are obtained from the IMF (2014). Arms transfers and share of military expenditure in GDP are obtained from SIPRI Stockholm-International-Peace-Research-Institute (2012). The list of arms importing countries is obtained from SIPRI (2014a). The list of oil exporting countries is obtained from the Association for the Study of Peak Oil & Gas USA (2014).

### **3.4.3 Theoretical framework for arms and oil importing countries**

According to Equation (54), it is hypothesized that the share of military expenditure in GDP in the last year, i.e. at time  $t-1$ , should have a negative effect on GDP growth in the present. This is because when the lagged share of military expenditure increases, the lagged share of investment in GDP might decrease. In addition, although military expenditure might create a good environment for the economy and encourage resource employment in the military sector, it may decrease resources availability in the civilian sector. Although military expenditure may encourage military manpower employment, it is argued that the effectiveness of labour in the military sector is lower than that of the civilian sector. Since the productivity of resources in the military sector is lower than that of the civilian sector, an increase in the share of military expenditure might affect GDP growth negatively. This is known as the “crowding-out effect” of military expenditure. Moreover, since arms and oil importing countries do not have defense industries, military expenditure may neither encourage resource employment nor military technology development, but increase arms imports.

It is also hypothesized that lagged GDP growth affects the current GDP growth positively. Aside from the statistical reasons that the use of lagged values as instruments helps to deal with endogeneity in some contexts, it is possible that lagged GDP growth seizes the impacts of lagged private investment, and hence influences current GDP growth.

It is conjectured that the share of investment in GDP should have a positive effect on GDP growth. This is because an increase in the share of investment leads to an increase in resource employment, and the productivity of resources in the civilian sector is high compared to the government sector. As a result, an increase in the share of investment should affect economic growth positively.

Theory suggests that population growth has an immediate negative effect on economic growth. This is because raising children absorbs resources, such as natural resources, capital, and labour, which could have more productive uses. Population growth may reduce saving propensity as well as potential investment.

According to Equation (55), it is possible that lagged GDP growth positively affects the current share of military expenditure in GDP. This is because when GDP growth increases, the government might increase public services, as well as military services. Hence, the share of military expenditure might increase.

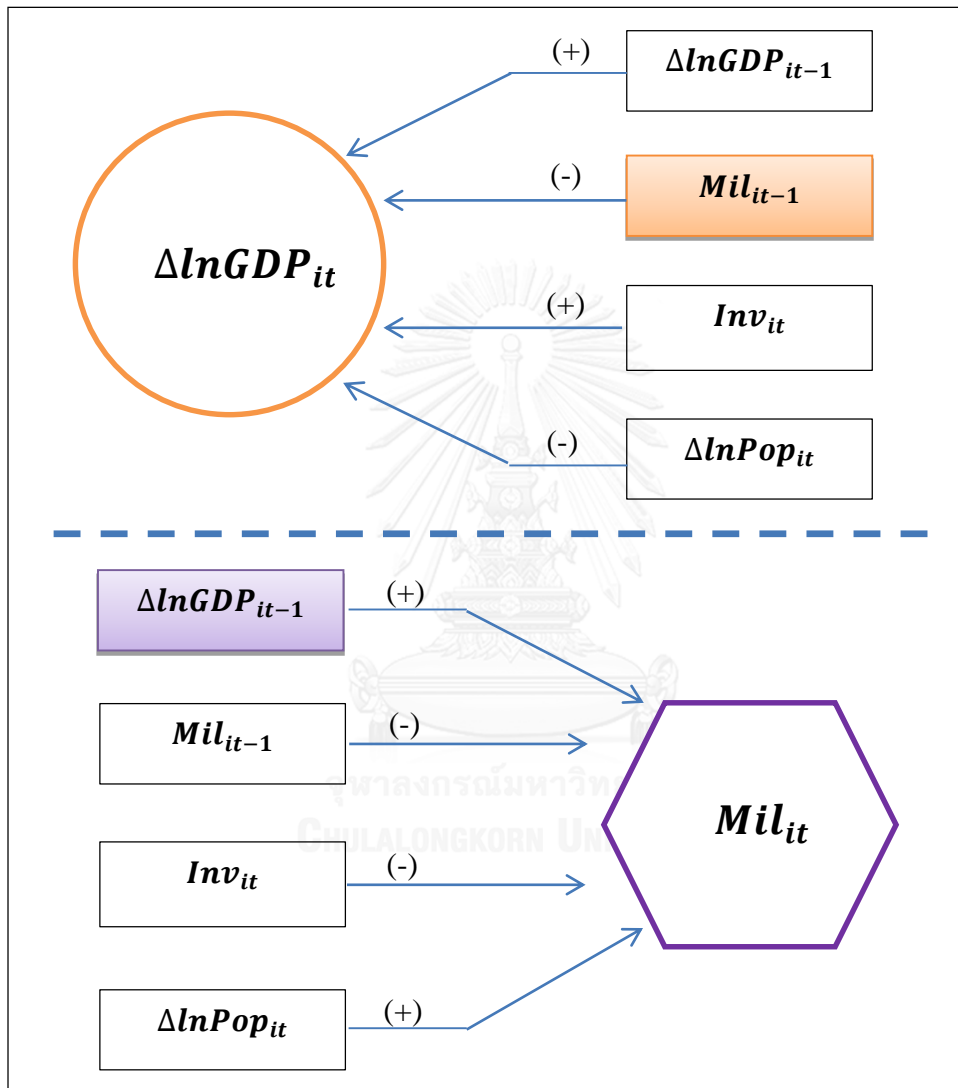
It is conjectured that the lagged share of military expenditure in GDP has a negative effect on the current share of military expenditure in GDP. This is because when the lagged share of military expenditure increases, the lagged share of investment in GDP might decrease, and ultimately the lagged GDP growth decreases. Since the current share of military expenditure in GDP is conjectured to decrease when the lagged GDP growth decreases, the current share of military expenditure decreases when the lagged share of military expenditure increases.

The share of investment in GDP should have a negative effect on the share of military expenditure in GDP. This is because, given that other factors remain unchanged, an increase in the share of investment in GDP leads to the decrease in the share of military expenditure in GDP.

Population growth should have a positive impact on the share of military expenditure in GDP in arms and oil importing countries. This is because when the population increases, the government may provide more public services, as well as military services.

In conclusion, the expected signs of the coefficients of the independent variables for arms and oil importing countries are shown in Figure 7.

Figure 7 The expected relationship between dependent and independent variables for arms and oil importing countries



#### 3.4.4 Analysis and discussion of the empirical results

Before investigating the relationship between military expenditure and economic growth in arms and oil importing countries, the stationarity assumption is tested. The panel unit root test which was developed by Maddala and Wu (1999), which does not require a balanced panel, is employed to test the stationary assumption. It

follows the Fisher test by combining the p-values from the N independent unit root tests. Based on the p-values of the individual unit root tests, the null hypothesis is that all series are non-stationary against the alternative hypothesis where at least one series in the panel is stationary. To compute the Maddala and Wu (1999), the Augmented Dickey-Fuller (1979) or ADF unit root test for each country is undertaken. After that, the value of  $\lambda$  is calculated using the given Equation (53).

$$\lambda = -2 \sum_{i=1}^N \ln(\rho_i) \sim \chi^2(2N) \quad (53)$$

$p_i$  are the probability values of the ADF(1) test with constant but without trend for individual variables and countries. They are the MacKinnon approximate p-value for Z test. Probabilities that equal 0.0000 are adjusted to be 0.0001 in order to enable calculation of  $p_i$ . Maddala and Wu's (1999) panel unit root test statistic follows a  $\chi^2$  with 2N degree of freedom. The estimates of the panel unit root statistics for all variables and countries are presented in Table 10. The  $\lambda$  statistic shows that *Mil* and *Inv* and *lnPop* are stationary at levels for the panel, whereas *lnGDP* is stationary at the first difference level.

In the next step, in order to deal with the correlation between  $\Delta \ln GDP_{it-1}$  and  $Mil_{it-1}$  and the error terms, instrumental variables; Estimated  $\Delta \ln GDP_{it-1}$  Estimated  $Mil_{it-1}$ , are calculated. After that, the time series structures of the residuals are analyzed. The result shows that they have AR(1) structures.

Equation (54) is then employed to investigate the impact of the regressors on economic growth in arms and oil importing countries. Firstly, the fixed effects model is examined. As can be seen from Table 11, with the F-statistic of 29.27 (with 4 and 1305 degree of freedom) for GDP growth, the  $H_0$  that all the coefficients of the cross-section are equal to zero at a 5% significance level is rejected. This finding indicates that at least one of the regressors affects economic growth in arms and oil importing

Table 10 Panel Unit Root Test ( $P_i$  Values) for arms and oil importing countries

No.	Country	Levels				First Difference			
		lnGDP	Mil	Inv	lnPop	lnGDP	Mil	Inv	lnPop
1	Afghanistan	0.9681	0.9285	0.9781	0.0212	0.0001	0.0084	0.2697	0.1610
2	Albania	0.0071	0.6900	0.2089	0.9833	0.0001	0.1000	0.0164	0.0001
3	Armenia	0.0218	0.6465	0.7892	1.0000	0.3108	0.4281	0.3309	1.0000
4	Austria	0.9568	0.8498	0.5469	0.9830	0.0052	0.0001	0.0001	0.0100
5	Bahrain	0.9677	0.2280	0.2805	0.9716	0.0005	0.0010	0.0001	0.0013
6	Bangladesh	0.9988	0.1947	0.7039	0.0001	0.0020	0.0001	0.5932	0.7918
7	Belize	0.3591	0.7006	0.0694	0.1029	0.0318	0.0004	0.0004	0.1077
8	Benin	0.0001	0.7618	0.3143	0.2507	0.7549	0.1269	0.0023	0.0001
9	Bolivia	0.9945	0.2171	0.2585	0.0001	0.0026	0.0001	0.0001	0.7339
10	Bosnia and Herzegovina	0.1598	0.0001	0.7411	0.0142	0.2275	0.0001	0.0082	0.6574
11	Botswana	0.8127	0.6519	0.5195	0.0001	0.0001	0.0078	0.0001	0.2133
12	Bulgaria	0.3059	0.9388	0.5788	0.6118	0.3772	0.0001	0.2197	0.0001
13	Burkina Faso	0.9974	0.0119	0.1727	0.8873	0.0073	0.0087	0.0001	0.7483
14	Burundi	0.4622	0.6918	0.0950	0.9959	0.0473	0.0083	0.0001	0.0454
15	Cambodia	0.8883	0.1399	0.3210	0.0343	0.0582	0.0002	0.0001	0.0553
16	Cameroon	0.9317	0.0192	0.0075	0.0004	0.0018	0.0001	0.0001	0.8852
17	Cape Verde	0.0037	0.6290	0.3882	0.0001	0.6534	0.4634	0.0001	0.4458
18	Central African Republic	0.8164	0.9847	0.0942	0.0014	0.0011	0.8403	0.0001	0.7138
19	Chad	0.9438	0.5227	0.3561	0.9206	0.0266	0.0072	0.0749	0.0002
20	Chile	0.9459	0.9243	0.2102	0.0001	0.0092	0.0001	0.0001	0.3878
21	Republic of Congo	0.8354	0.0294	0.0002	0.4037	0.0002	0.0001	0.0001	0.0001
22	Cote d'Ivoire	0.9329	0.1515	0.1288	0.4572	0.0014	0.0001	0.1187	0.0001
23	Croatia	0.0460	0.0001	0.9087	0.9795	0.6033	0.0002	0.1203	0.2841
24	Djibouti	0.9951	0.3916	0.9974	0.9879	0.0763	0.0018	0.1941	0.0014
25	Dominican Republic	0.9381	0.6302	0.5395	0.4751	0.0016	0.0779	0.0015	0.0001
26	El Salvador	0.6701	0.0001	0.3863	0.1298	0.0002	0.0025	0.0001	0.4426
27	Eritrea	0.0029	0.3087	0.0058	1.0000	0.0099	0.0072	0.0001	0.1663
28	Estonia	0.3803	0.5512	0.3412	0.0001	0.1627	0.0003	0.0264	0.0006
29	Ethiopia	0.9768	0.3883	0.6836	0.0001	0.0001	0.0019	0.0001	0.0362
30	Fiji	0.3799	0.0248	0.1327	0.0001	0.0012	0.0001	0.0001	0.9039
31	The Gambia	0.0359	0.1447	0.5070	0.0759	0.2985	0.0112	0.0305	0.8175
32	Georgia	0.7006	0.6155	0.1738	0.8564	0.0530	0.3562	0.0013	0.1642
33	Ghana	0.9981	0.0089	0.0931	0.9713	0.0005	0.0001	0.0001	0.0001
34	Greece	0.5489	0.7548	0.9165	0.0001	0.6962	0.0026	0.0099	0.4788
35	Guatemala	0.9952	0.4141	0.8301	0.9626	0.0278	0.0001	0.0776	0.0001
36	Guinea	0.9086	0.6513	0.2102	0.0001	0.0001	0.1377	0.0028	0.2194
37	Guinea-Bissau	0.7214	0.0005	0.0561	1.0000	0.0872	0.0001	0.0002	0.0001
38	Guyana	0.9990	0.1941	0.8758	0.6576	0.2975	0.1057	0.2493	0.0001
39	Honduras	0.9302	0.7396	0.1131	0.8701	0.1666	0.0026	0.0039	0.0030
40	Hungary	0.3045	0.9320	0.8848	0.9889	0.1428	0.0001	0.0001	0.0108
41	Iceland	0.0051	0.0001	0.7338	0.6924	0.1482	1.0000	0.0001	0.0342
42	Ireland	0.0081	0.0514	0.9204	0.9841	0.4708	0.0136	0.3290	0.6140
43	Jamaica	0.0703	0.3561	0.4256	0.0001	0.0014	0.0001	0.0001	0.9088
44	Japan	0.2958	0.0973	0.4058	0.0001	0.0001	0.0001	0.0010	0.9525
45	Jordan	0.9953	0.4709	0.3979	0.0001	0.0003	0.0001	0.0032	0.0340
46	Kenya	0.9854	0.4922	0.6277	1.0000	0.0283	0.0001	0.0001	0.6681
47	Kyrgyz Republic	0.9368	0.4503	0.9690	0.9624	0.0013	0.0001	0.0011	0.0255
48	Latvia	0.5907	0.4620	0.5653	0.9925	0.1762	0.1455	0.0624	0.3777
49	Lebanon	0.7744	0.1785	0.6252	0.9738	0.0874	0.0027	0.0424	0.1928
50	Lesotho	0.9988	0.2597	0.4430	0.0042	0.0031	0.0001	0.0901	0.4394
51	Lithuania	0.4282	0.8101	0.2292	0.9844	0.1331	0.0030	0.0049	0.0258
52	Luxembourg	0.5128	0.6084	0.1241	1.0000	0.0176	0.0001	0.0001	0.2337
53	Madagascar	0.8178	0.7280	0.5919	0.0001	0.0001	0.0001	0.0002	1.0000
54	Malawi	0.5590	0.4545	0.3491	1.0000	0.0001	0.0535	0.0676	0.0016
55	Mali	0.7876	0.7928	0.2774	0.9438	0.0001	0.0013	0.0001	0.0001
56	Malta	0.9016	0.0995	0.2774	0.0001	0.0001	0.0037	0.0001	0.2629
57	Mauritius	0.4316	0.0755	0.0323	0.0001	0.0187	0.0001	0.0001	0.2557
58	Moldova	0.9911	0.2512	0.3425	0.1027	0.0366	0.0405	0.0002	0.0001
59	Mongolia	0.9957	0.4535	0.9395	0.9988	0.0051	0.0001	0.0005	0.0017
60	Montenegro	0.0001	0.0150	0.7234	0.9926	0.4598	0.0001	0.3426	0.3249
61	Mozambique	0.5327	0.1887	0.3367	0.0008	0.0001	0.0002	0.0003	0.2926
62	Myanmar	0.6654	0.9246	0.9962	0.9568	0.0243	0.0001	0.0593	0.0001
63	Namibia	0.9347	0.0157	0.0019	0.0001	0.0001	0.0001	0.0001	0.3998
64	Nepal	0.9690	0.0122	0.7168	0.0009	0.3435	0.0291	0.0001	0.2262
65	New Zealand	0.2288	0.3345	0.1032	0.5601	0.0028	0.0001	0.0020	0.2960

Table 10 Panel Unit Root Test ( $P_i$  Values) for arms and oil importing countries  
(Continued)

No.	Country	Levels				First Difference			
		lnGDP	Mil	Inv	lnPop	lnGDP	Mil	Inv	lnPop
66	Nicaragua	0.9899	0.7661	0.6673	0.9113	0.2084	0.0371	0.0034	0.0001
67	Niger	0.9413	0.3138	0.9631	0.0024	0.0001	0.0102	0.0015	0.6491
68	Pakistan	0.9713	0.1106	0.4286	0.8651	0.0001	0.0094	0.0029	0.0002
69	Panama	0.8938	0.8354	0.0001	0.0105	0.0284	0.0001	0.4151	0.8047
70	Papua New Guinea	0.9784	0.2427	0.1348	0.0048	0.0302	0.0001	0.0015	0.0001
71	Paraguay	0.9981	0.1183	0.5170	0.0001	0.0001	0.0002	0.0001	0.1900
72	Peru	0.9777	0.1107	0.8200	0.9558	0.0644	0.0321	0.0001	0.0051
73	Philippines	0.9763	0.5218	0.2874	0.6206	0.0001	0.0001	0.0013	0.0014
74	Portugal	0.1396	0.1187	0.9889	0.5316	0.2294	0.0004	0.0056	0.3381
75	Romania	0.2573	0.3963	0.2690	0.4808	0.1989	0.1980	0.0520	0.0046
76	Rwanda	0.9225	0.7799	0.6504	0.8265	0.0002	0.0001	0.0001	0.0010
77	Senegal	0.8968	0.5974	0.6689	0.9835	0.0376	0.2081	0.0099	0.0001
78	Serbia	0.0001	0.0040	0.2068	0.9469	0.5893	0.0002	0.0064	0.5879
79	Seychelles	0.9122	0.0001	0.0368	0.7759	0.0038	0.0001	0.0001	0.0001
80	Sierra Leone	0.3843	0.7355	0.4320	0.0001	0.2716	0.0001	0.1617	0.7590
81	Singapore	0.3952	0.7504	0.3731	0.9060	0.0008	0.0003	0.0001	0.1315
82	Slovak Republic	0.8859	0.3598	0.5067	0.4910	0.0310	0.0001	0.0003	0.0001
83	Slovenia	0.0752	0.4876	0.8590	0.9972	0.3023	0.0197	0.0121	0.0536
84	Sri Lanka	0.9948	0.4570	0.6440	0.0001	0.0019	0.0004	0.0001	0.7437
85	Swaziland	0.1224	0.8638	0.0399	0.0791	0.0169	0.0001	0.0001	0.0008
86	Taiwan Province of China	0.0156	0.4166	0.2623	0.0001	0.0035	0.0001	0.0001	0.5850
87	Tajikistan	0.9987	0.8236	0.5114	0.3962	0.7962	0.4069	0.0218	0.0867
88	Tanzania	0.9868	0.0031	0.9830	0.8149	0.0322	0.0001	0.1043	0.0001
89	Thailand	0.9894	0.1268	0.0506	0.3369	0.0391	0.0191	0.0069	0.0021
90	Togo	0.9286	0.7760	0.1848	0.0175	0.0001	0.0001	0.0001	0.9020
91	Turkey	0.4909	0.0001	0.0374	0.9985	0.0534	0.2780	0.0007	0.8911
92	Uganda	0.1147	0.0028	0.9234	1.0000	0.0001	0.0001	0.0001	0.4884
93	Uruguay	0.9941	0.7862	0.6237	0.9986	0.3633	0.0216	0.0008	0.5448
94	Zambia	0.9717	0.0047	0.8161	1.0000	0.0499	0.0001	0.6075	0.9786
$\lambda$		207.0489	353.9149	** 250.6114	** 561.5746	** 869.1549	** 1223.4887	** 1172.1034	** 692.6655
$\chi^2$ (186) CV(5%)		220.9908							

Notes: \*\* denotes significance level at 5%. CV(5%) denotes the corresponding 5% critical value.

countries. The random effects model is then examined and Wald's test is performed. The Wald test is the test for the joint significance of the estimated coefficients which is distributed as a  $\chi^2$  under the  $H_0$  of no relationship. The result of Wald's test indicates that the regressors in the model affect GDP growth. After that, Hausman test is used to specify whether a fixed or a random effects model is more appropriate. The Hausman test is distributed as  $\chi^2$  with the degrees of freedom equal to the number of regressors under the  $H_0$  of difference in coefficients not systematic. The result suggests that the fixed effects model might be more appropriate. Hence, the fixed effects model is used for the investigation. Clustered standard errors at the country level are used to correct for the presence of heteroscedasticity of unknown form.

Table 11 Fixed-effects estimation results for arms and oil importing countries (sample 1992-2013)

	$\Delta \ln GDP_{it}$	$Mil_{it}$
$\Delta \ln GDP_{it-1}$		-0.6287 [0.3195] (-1.9700)
<i>Estimated</i> $\Delta \ln GDP_{it-1}$	0.2222 [0.1597] (1.3900)	
$Mil_{it-1}$	-0.0025 [0.0022] (-1.1500)	
<i>Estimated</i> $Mil_{it-1}$		0.5191** [0.1176] (4.4100)
$Inv_{it}$	0.0014** [0.0005] (2.7000)	-0.0038 [0.0058] (-0.6500)
$\Delta \ln Pop_{it}$	0.8396 [0.6149] (1.3700)	2.6206** [0.4757] (5.5100)
Constant	-0.0065 [0.1264] (-0.5100)	1.0528 [0.2628] (4.0100)
F-test (4, 1305)	29.2700**	45.6800**
Wald Test ( $\chi^2_4$ )	212.5400**	7974.9400**
Hausman Test ( $\chi^2_4$ )	23.4600	162.8000
F-test (4, 93) (clustered)	5.3300**	13.6800**
Number of observation	1403	1403
Number of group	94	94

Notes: Numbers in brackets [.] are clustered standard errors. Numbers in parentheses (.) are t statistics. \*\* denotes significance level at 5%.



Table 11 presents the estimation results of the dynamic fixed effects models. Theory suggests that the lagged share of military expenditure in GDP has a negative effect on current GDP growth. The study result presented in Table 11 shows the negative effect of the lagged share of military expenditure on GDP growth. However, the result is insignificant at a 5% level of confidence. This might be because these countries employ a lot of military manpower and these personnel also provide services to the civilian sector, such as helping people during disasters. Therefore, military expenditure brings about some economic benefits, and hence reduces negative impacts on GDP growth. Nonetheless, the finding does not oppose the conclusion of Alptekin and Levine (2012) which stated that the hypothesis of a negative military expenditure-growth relationship is not supported for both less developed countries and in general, and a positive effect of military expenditure on economic growth is supported for developed countries.

For the impact of lagged GDP growth, theory suggests that lagged GDP growth has a positive effect on current GDP growth. The study result shows a positive relationship between lagged and current GDP growth. However, it is insignificant at a 5% level of confidence. This might be because, for arms and oil importing countries, current GDP growth is influenced by current private investment rather than lagged private investment.

Theoretically, the share of investment in GDP has a positive effect on GDP growth. The study result supports this hypothesis. It is found that the share of investment has a significant positive impact on economic growth in arms and oil importing countries. This implies that capital stock is an instrument of economic growth in these countries. The study result indicates that if the share of investment in GDP increases 1%, the growth of GDP will increase 0.14%.

Theory suggests that population growth has a negative effect on economic growth in arms and oil importing countries. However, the study result shows that the relationship between population growth and GDP growth is insignificant at a 5% level of confidence. This implies that the effect of population may not depend only on population

number, but also on other factors, for instance, the age structure. Assuming other factors remain unchanged, whether total population growth increases or decreases, if adult population growth is higher than total population growth, GDP growth should increase. Although it is insignificant, the positive sign of the coefficient implies that, for these countries, when the growth of population increases, GDP growth tends to increase.

Next, Equation (55) is used to investigate the impact of the regressors on the share of military expenditure. The fixed effects model is tested and the F test is performed (Table 14). With the F-statistic of 45.6800 (with 4 and 1305 degree of freedom), the  $H_0$  that all the coefficients of the cross-section are equal to zero at a 5% level is rejected. It is concluded that at least one of the regressors affects the share of military expenditure in arms exporting countries. Then, the random effects model is tested and Wald's test is performed. With the result of the Wald test of 7974.94 (with 4 degrees of freedom), the  $H_0$  that all the coefficients of the cross-section are equal to zero at a 5% level is rejected. It is concluded that at least one of the regressors affects the share of military expenditure in arms exporting countries. The result indicates that the share of military expenditure is affected by the regressors. The Hausman test is then performed to specify whether a fixed or a random effects model is more appropriate. The result suggests that the fixed effects model might be more appropriate. Hence, the fixed effects model is used for the investigation. Clustered standard errors at the country level are used to correct for the presence of heteroscedasticity of unknown form.

Table 11 shows the estimation results regarding the impacts of the regressors on the share of military expenditure in GDP. Theoretically, lagged GDP growth positively affects the current share of military expenditure in GDP. The study result, however, shows that the relationship between the lagged GDP growth and the current share of military expenditure is insignificant at a 5% level of confidence. This implies that the share of military expenditure is not driven by GDP growth in the past at a 5% level. That is, arms and oil importing countries spend on military expenditure regardless of GDP growth. The sign of the coefficient is negative. This might be because when the lagged GDP growth increases, governments do not increase only military expenditure, but also non-military government expenditure; health, education, and communication services, etc. It is possible that, even though the volume of military expenditure

increases, the share of military expenditure in GDP does not increase, or even decreases, because non-military government expenditure also increases.

The lagged share of military expenditure in GDP is conjectured to have a negative effect on the current share of military expenditure in GDP. However, the study result shows a significantly positive effect of the lagged share of military expenditure on the current share of military expenditure at a 5% level of confidence. This might be because, in arms and oil importing countries, the share of military expenditure in GDP growth depends on other factors, such as the bargaining power of the military sector, rather than economic reasons. The result indicates that if the lagged share of military expenditure increases 1%, the current share of military expenditure will increase 0.52%.

Theory suggests that the share of investment in GDP has a negative effect on the share of military expenditure in GDP. However, the study result shows that the relationship between the share of investment in GDP and the share of military expenditure in GDP is insignificant at a 5% level of confidence. This means that when the share of investment in GDP increases, the share of military expenditure in GDP may or may not decrease perhaps because the share of military expenditure in GDP of arms and oil importing countries depends on other factors, such as the bargaining power of the military sector and the political factor, rather than economic reasons. Although it is insignificant, the sign of the coefficient does not oppose the hypothesis. The negative sign indicates that when the share of private investment in GDP increases, the share of military expenditure in GDP tends to decrease.

It is conjectured that population growth has a positive impact on the share of military expenditure in GDP. The study result reveals that the growth of population positively affects military expenditure in arms and oil importing countries significantly at a 5% level of confidence. This is because when the population increases, governments may provide more public services, as well as military services, and thus military expenditure increases. The study result indicates that if the population growth increases 1%, the share of military expenditure will increase 2.62%.

### 3.4.5 Conclusion

This part uses the time period of data from 1992 to 2013 to examine the relationship between military expenditure and economic growth in 94 arms and oil importing countries. The motivation for focusing on arms importing countries is their specific characteristics and purposes of military expenditure. They have neither large defense industries nor oil industries. It is, therefore, conjectured that an increase in the share of military expenditure leads to a decrease in economic growth.

According to the study result, no evidence supports the idea that the share of military expenditure stimulates economic growth in arms and oil importing countries. For arms and oil importing countries, the relationship between the share of military expenditure and economic growth is negative, although it is insignificant. Theoretically, the share of military expenditure should have a significantly negative effect on economic growth. However, perhaps the military sector of these countries brings about some economic benefits by providing both military and non-military services for the civilian sector, therefore the negative impacts of military expenditure on GDP growth are reduced. In addition, it is found that in these countries capital stock is an instrument of economic growth, as explained in the Barro growth and the Solow growth models. Furthermore, there is no evidence that supports the idea that population growth affects economic growth in these countries.

The study result shows that, for arms and oil importing countries, governments spend on military expenditure regardless of GDP growth. Although it is insignificant, the study result implies that when the lagged GDP growth increases, the share of military expenditure tends to decrease. This might be because when the lagged GDP growth increases, the governments do not increase only military expenditure, but also non-military government expenditure. Since war is not a crucial issue in these countries, the change of non-military government expenditure might be larger than that of military expenditure. The results also show that the current share of military expenditure is influenced by the lagged share of military expenditure, but is not affected by the current share of investment. These findings imply that, for these countries, the current share of military expenditure depends on other

factors, such as the power of the military sector, rather than economic reasons. In addition, the study result reveals that the growth of population positively affects the share of military expenditure. This means that, assuming other factors are unchanged, when the population increases, the governments provide more military services.

### **3.5 Military expenditure and economic growth in oil exporting but arms importing countries**

#### **3.5.1 Motivation and objective**

The aim of this part is to examine the relationship between military expenditure and economic growth in 28 oil exporting countries but arms importing countries using unbalanced panel data over the time period from 1992 to 2013. The motivation for focusing on this group of countries is their specific characteristics. These countries are oil rich countries. Many countries have attempted to exploit their stocks of oil. Therefore, they spend a large amount of money on military expenditure to protect their resources from their enemies. It is possible that spending a larger amount of budget on military activities creates a stable and secure environment, and hence encourages economic growth in these countries. However, it is also possible that the larger share of military expenditure decreases domestic demand through increases in arms imports as well as decreases in consumption and investment. Furthermore, although a number of studies on the economic impact of military expenditure have been conducted, there is no study focusing on oil exporting countries.

#### **3.5.2 Methodology**

This section employs secondary panel data during the time period 1989 and 2013 for 28 oil exporting but arm importing countries. Panel data techniques are employed because they offer a better framework for statistical inference compared to other techniques. As previously stated, they can be applied to measure the individual changes in a set of variables directly. In addition, recursive VAR models are employed because, according to Finkel (1995), they are suitable for causality analysis. In this type of

model, the lagged value and a series of independent variables, as well as a serially uncorrelated error term, are used as independent variables.

To formulate the model to investigate the relationship between military expenditure and economic growth in oil exporting but arms importing countries, this section applies the Barro growth model to specify variables.  $GDP_{it}$  denotes the real GDP of country  $i$  at time  $t$ ,  $Mil_{it}$  denotes a share of military expenditure in GDP of country  $i$  at time  $t$ ,  $Pop_{it}$  denotes the number of population of country  $i$  at time  $t$ , and  $Inv_{it}$  denotes the share of investment in GDP of country  $i$  at time  $t$ . Then, take the natural log of  $GDP_{it}$  and  $Pop_{it}$ . Let  $\varepsilon_{yit}$ , and  $\varepsilon_{milit}$  be error terms and are assumed serially uncorrelated error terms. After that, set the differentiated forms of the natural log of GDP and the natural log of population. In this thesis, the share of investment in GDP is a proxy for capital good, and the population growth is a proxy for labor input. Because of data limitations, the time dimension of the panel is not large. This section therefore considers the maximum of 2 lags and lagged values to be included in each equation. The lagged length to include in each equation can be determined by many different methods, such as the Akaike information criterion (AIC), the Schwarz information criterion, the Bayes information criteria (BIC), and the Hannan and Quinn criterion (HQC). In this part, the lagged length is selected by the HQC criterion. Given the common optimal lag length is 1, the relationship between military expenditure and economic growth can take the following form:

$$\Delta \ln GDP_{it} = \alpha_0 + \alpha_1 \Delta \ln GDP_{it-1} + \alpha_2 Mil_{it-1} + \alpha_3 Inv_{it} + \alpha_4 \Delta \ln Pop_{it} + \varepsilon_{yit} \quad (56)$$

$$Mil_{it} = \beta_0 + \beta_1 \Delta \ln GDP_{it-1} + \beta_2 Mil_{it-1} + \beta_3 Inv_{it} + \beta_4 \Delta \ln Pop_{it} + \varepsilon_{milit} \quad (57)$$

where  $GDP_{it}$  = real GDP of country  $i$  at time  $t$  (unit: local currency)

$Mil_{it}$  = a share of military expenditure in GDP of country  $i$  at time  $t$  (unit: %)

$Inv_{it}$  = the share of investment in GDP of country  $i$  at time  $t$  (unit: %)

$Pop_{it}$  = Number of population of country  $i$  at time  $t$  (unit: persons)

$\alpha_0, \beta_0$  = constant

$\alpha_1, \alpha_2, \alpha_3, \alpha_4, \beta_1, \beta_2, \beta_3,$  and  $\beta_4$  = coefficients

- $\varepsilon$  = error term
- $i$  = 28 oil exporting but arms importing countries
- $t$  = 1992,..., 2013 (It should be noted that the panel data in this part are unbalanced because the data for some countries are not available in some periods of time.).

The presence of the lagged values of  $\Delta \ln GDP_{it}$  and  $Mil_{it}$  shows the explicit changes in  $\Delta \ln GDP_{it}$  and  $Mil_{it}$  over time (Kollias et al., 2007). The direct evidence of a causal effect from  $Mil_{it}$  to  $\Delta \ln GDP_{it}$  is revealed when the study result shows that the lagged variable of  $Mil_{it}$  is associated with changes in  $\Delta \ln GDP_{it}$ . However, the lagged independent variables  $\Delta \ln GDP_{it}$  in Equation (56) and  $Mil_{it}$  in Equation (57) are correlated with the error terms (Anderson and Hsiao, 1982). This bias approaches zero as the time dimension (T) is large (Nickell (1981)). Because the time dimension is not large, the problem of the biased estimator must be rectified by using instrument variables.  $\Delta \ln GDP_{it-2}$  and  $Mil_{it-2}$  are used as instrumental variables for  $\Delta \ln GDP_{it-1}$  and  $Mil_{it-1}$ , respectively. After the adjustment, i.e. using the instrument variables, there are 415 observations for investigation.

Data are obtained from various sources. Nominal Gross Domestic Product, share of government spending, share of investment, inflation rate and number of population are obtained from the IMF (2014). Arms transfers and share of military expenditure in GDP are obtained from Stockholm-International-Peace-Research-Institute (2012). The list of arms importing countries is obtained from SIPRI (2014a). The list of oil exporting countries is obtained from Association for the Study of Peak Oil & Gas USA (2014).

### **3.5.3 Theoretical framework for oil exporting but arms importing countries**

According to Equation (56), it is hypothesized that the share of military expenditure in GDP in the last year has a negative effect on the current GDP growth in oil exporting but arms importing countries. This is the result of “crowding-out effects”. It is possible that military expenditure creates a good environment for the economy and

increases resource employment in the military sector. However, it may decrease resource availability for the civilian sector. In addition, since the productivity of resources in the military sector is lower than that of the civilian sector, increases in resource employment in the military sector might not stimulate GDP growth.

In addition, similar to the case of arms and oil importing countries, since arms and oil importing countries do not have defense industries, military expenditure may neither encourage resource employment nor military technology development, but increase imports of weapons. Even though military expenditure may encourage military manpower employment, it is argued that the effectiveness of labour in the military sector is lower than that of the civilian sector.

It is also hypothesized that lagged GDP growth has a positive effect on current GDP growth. This is because lagged GDP growth seizes the impacts of lagged private investment, and therefore, influences current GDP growth.

Similar to the case of arms and oil importing countries, it is conjectured that the share of investment in GDP has a positive effect on GDP growth. This is because an increase in the share of investment leads to an increase in resource employment. Since the productivity of resources in the civilian sector is higher than in the government section, especially the military sector, the increase in the share of investment in GDP should positively affect economic growth.

As previously stated in the case of arms and oil importing countries, it is conjectured that population growth has an immediate negative effect on the rate of economic growth. This is because raising children absorbs resources that could be allocated to have more productive uses. As a result, population growth may reduce saving propensity and ultimately reduce investments. Therefore, GDP growth may decrease when population growth increases.

According to Equation (57), it is hypothesized that lagged GDP growth has a positive effect on the current share of military expenditure in GDP. This is because



when GDP growth increases, the government might increase public services, as well as military services. Hence, the share of military expenditure might increase.

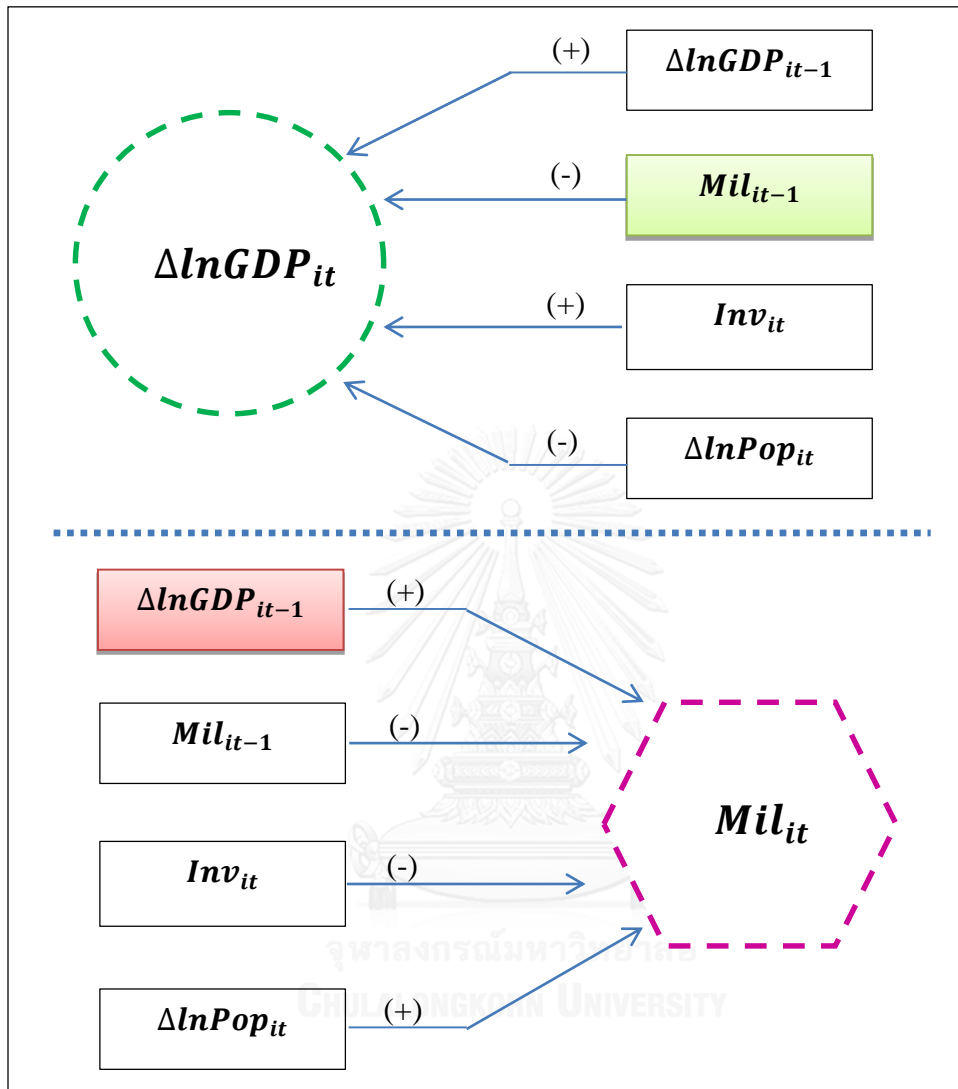
It is also hypothesized that the lagged share of military expenditure in GDP has a negative effect on the current share of military expenditure in GDP. This is because when the lagged share of military expenditure increases, the lagged share of investment in GDP might decrease, and ultimately lagged GDP growth decreases. Since the current share of military expenditure in GDP is conjectured to decrease when the lagged GDP growth decreases, the current share of military expenditure decreases when the lagged share of military expenditure increases.

The share of investment in GDP should have a negative effect on the share of military expenditure in GDP. This is because, given that other factors remain unchanged, an increase in the share of investment in GDP leads to a decrease in the share of military expenditure in GDP.

Similar to the case of arms and oil importing countries, population growth is hypothesized to have a positive effect on the share of military expenditure in GDP. This is because when the population increases, the government may provide more public services, as well as military services.

The expected relationship between the dependent and independent variables for oil exporting but arms importing countries are summarized in Figure 8.

Figure 8 The expected relationship between dependent and independent variables for oil exporting but arms importing countries



### 3.5.4 Analysis and discussion of the empirical results

Before investigating the feedback of military expenditure and economic growth, the stationarity assumption is tested using Maddala and Wu's (1999) panel unit root test. This test does not require a balanced panel. It follows the Fisher test by combining the p-values from the N independent unit root tests. Based on the p-values of the individual unit root tests, the null hypothesis is that all series are non-stationary against the alternative hypothesis where at least one series in the panel is stationary. The

Augmented Dickey-Fuller (1979) or ADF unit root test for each country is undertaken. After that, the value of  $\lambda$  is calculated using Equation (53).

$$\lambda = -2 \sum_{i=1}^N \ln(\rho_i) \sim \chi^2(2N) \quad (53)$$

$p_i$  are the probability values of the ADF(1) test with constant but without trend for individual variables and countries. They are the MacKinnon approximate p-value for Z test. Probabilities that equal 0.0000 are adjusted to be 0.0001 in order to enable calculation of  $p_i$ . Maddala and Wu's (1999) panel unit root test statistic follows a  $\chi^2$  with  $2N$  degree of freedom. From Table 12, the  $\lambda$  statistic shows that only *Inv* is stationary at levels for the panel whereas *Mil*, *lnGDP* and *lnPop* are stationary at the first difference level.

Hence, Equations (56) and (57) used for investigating the feedback of military expenditure and economic growth in oil exporting but arms importing counties are replaced by Equations (56a) and (57a) as shown in the following equations.

$$\Delta \ln GDP_{it} = \alpha_0 + \alpha_1 \Delta \ln GDP_{it-1} + \alpha_2 \Delta Mil_{it-1} + \alpha_3 Inv_{it} + \alpha_4 \Delta \ln Pop_{it} + \varepsilon_{yit} \quad (56a)$$

$$\Delta Mil_{it} = \beta_0 + \beta_1 \Delta \ln GDP_{it-1} + \beta_2 \Delta Mil_{it-1} + \beta_3 Inv_{it} + \beta_4 \Delta \ln Pop_{it} + \varepsilon_{milit} \quad (57a)$$

where  $GDP_{it}$  = real GDP of country  $i$  at time  $t$  (unit: local currency)

$Mil_{it}$  = a share of military expenditure in GDP of country  $i$  at time  $t$  (unit: %)

$Inv_{it}$  = the share of investment in GDP of country  $i$  at time  $t$  (unit: %)

$Pop_{it}$  = Number of population of country  $i$  at time  $t$  (unit: persons)

$\alpha_0, \beta_0$  = constant

$\alpha_1, \alpha_2, \alpha_3, \alpha_4, \beta_1, \beta_2, \beta_3,$  and  $\beta_4$  = coefficients

$\varepsilon$  = error term

$i$  = 28 oil exporting but arms importing countries

Table 12 Panel Unit Root Test ( $P_i$  Values) for oil exporting but arms importing countries

No.	Country	Levels				First Difference			
		lnGDP	Mil	Inv	lnPop	lnGDP	Mil	Inv	lnPop
1	Algeria	0.9650	0.1066	0.8990	0.9944	0.0403	0.0739	0.0003	0.2233
2	Angola	0.6114	0.3208	0.3164	0.5866	0.4709	0.1300	0.5796	0.9834
3	Argentina	0.9843	0.8125	0.2285	0.5611	0.6346	0.5520	0.7110	0.9909
4	Australia	0.8495	0.5204	0.3061	1.0000	0.0019	0.0001	0.0018	0.3462
5	Azerbaijan	0.6271	0.6171	0.0812	0.9813	0.1292	0.0889	0.0011	0.6487
6	Brunei Darussalam	0.3027	0.0111	0.0001	0.2519	0.1296	0.0638	0.2101	0.0045
7	Colombia	0.9871	0.3202	0.1983	0.0824	0.2253	0.0001	0.0807	0.0020
8	Democratic Republic of the C	0.9125	0.6544	0.9397	0.9510	0.9573	0.1599	0.8082	0.0001
9	Ecuador	0.0001	0.9874	0.8848	0.8185	0.3614	0.3680	0.0001	0.0001
10	Egypt	0.1073	0.9584	0.4966	0.9642	0.6657	0.0638	0.2579	0.5149
11	Gabon	0.6810	0.9154	0.3542	0.9965	0.1256	0.6909	0.8305	0.4237
12	India	0.9890	0.0434	0.8913	0.1814	0.0962	0.0097	0.0721	0.6321
13	Indonesia	0.9956	0.1486	0.5242	0.9523	0.8748	0.0001	0.9812	0.9796
14	Islamic Republic of Iran	0.9586	0.1292	0.0004	0.9703	0.0151	0.0064	0.0001	0.0199
15	Kazakhstan	0.0494	0.6346	0.6975	0.9986	0.8878	0.6824	0.6938	0.9689
16	Kuwait	0.8941	0.6090	0.2999	0.6815	0.0082	0.0002	0.0001	0.0451
17	Malaysia	0.7965	0.4926	0.5947	0.3870	0.0055	0.2305	0.0280	0.7144
18	Mexico	0.9258	0.8120	0.2011	0.9986	0.0002	0.8043	0.0001	0.9119
19	Nigeria	0.2631	0.7858	0.6531	0.8021	0.6194	0.1063	0.3716	0.7356
20	Oman	0.9573	0.7807	0.2379	0.0232	0.0155	0.0140	0.0001	0.4459
21	Qatar	0.0356	0.5062	0.7434	0.1323	0.9899	0.0580	0.9610	0.9972
22	Saudi Arabia	0.4687	0.0722	0.9640	0.6661	0.6983	0.6461	0.7343	0.6141
23	Sudan	0.5765	0.4256	0.7212	0.9963	0.5412	0.0951	0.0660	0.0768
24	Syria	0.8422	0.7859	0.2087	0.6820	0.0220	0.0001	0.0533	0.8571
25	Trinidad and Tobago	0.1516	0.9847	0.8649	0.0001	0.7758	0.5276	0.6107	0.9862
26	United Arab Emirates	0.4122	0.5413	0.9541	0.7531	0.8139	0.8618	0.8112	0.4217
27	Venezuela	0.8743	0.1330	0.0990	0.0211	0.0830	0.0030	0.0135	0.7245
28	Vietnam	0.9278	0.0017	0.0015	0.0517	0.3328	0.5219	0.8234	0.8870
$\lambda$		35.5210	67.8199	89.2517 **	63.0741	117.2278 **	185.7482 **	185.5869 **	96.3618 **
$\chi^2(56) CV(5\%)$		74.4683							

Notes: \*\* denotes significance level at 5%. CV(5%) denotes the corresponding 5% critical value.

$t = 1992, \dots, 2013$  (It should be noted that the panel data in this part are unbalanced because the data for some countries are not available in some periods of time.).

Next, instrumental variables  $Estimated \Delta \ln GDP_{it-1}$  and  $Estimated Mil_{it-1}$ , are calculated in order to deal with the correlation between  $\Delta \ln GDP_{it-1}$  and  $Mil_{it-1}$  and the error terms. After that, the time series structures of the residuals are analyzed. The result shows that they have AR(1) structures.

The next step is to examine the impact of the regressors on economic growth in oil exporting but arms importing countries using Equation (56a). The fixed effects model is examined at first glance. With the F-statistic of 2.15 (with 4 and 383 degree of freedom) for GDP growth, according to Table 13, the  $H_0$  that all the coefficients of the cross-section are equal to zero at a 5% significance level is rejected. This implies that at least one of the regressors affects economic growth in oil exporting but arms importing countries. The next step is to examine the random effects model. Wald's test is performed. The Wald test is the test for the joint significance of the estimated coefficients, which is distributed as a  $\chi^2$  under the  $H_0$  that there is no relationship between the regressors and GDP growth. The result shows that at least one of the regressors affects GDP growth. The Hausman test, which is distributed as  $\chi^2$  with the degrees of freedom equal to the number of regressors under the  $H_0$  of difference in coefficients not systematic, is performed to specify whether a fixed or a random effects model is more appropriate. The result indicates that the fixed effects model might be more appropriate. Hence, the fixed effects model is employed. Clustered standard errors at the country level are used to correct for the presence of heteroscedasticity of unknown forms.

The estimation results of the dynamic models for oil exporting but arms importing countries are presented in Table 13. It is hypothesized that the lagged share of military expenditure in GDP has a negative effect on GDP growth. The study result supports this hypothesis. It is found that the change of share of military expenditure has a significantly negative effect on economic growth in oil exporting but arms importing countries at a 5% level of confidence. The result indicates the crowding-out effects of military expenditure. It is found that if the change of the share of military expenditure increases by 1%, the growth of GDP will decrease by 0.18%. This finding opposes the conclusion of Alptekin and Levine (2012) which stated that the hypothesis of a negative relationship between military expenditure and economic growth is not supported for both less developed countries and in general, and a positive effect of military expenditure on economic growth is supported for developed countries.

Table 13 The estimation results for oil exporting but arms importing countries  
(sample 1992-2013)

	$\Delta \ln GDP_{it}$	$\Delta Mil_{it}$
$\Delta \ln GDP_{it-1}$		0.38178 [0.3719] (1.0300)
<i>Estimated</i> $\Delta \ln GDP_{it-1}$	0.3359** [0.0560] (6.0000)	
$\Delta Mil_{it-1}$	-0.0018** [0.0002] (-10.8000)	
<i>Estimated</i> $\Delta Mil_{it-1}$		0.1625** [0.0160] (10.1500)
$Inv_{it}$	0.0005 [0.0012] (0.4400)	0.00533 [0.0036] (1.4700)
$\Delta \ln Pop_{it}$	-0.1173 [0.1473] (-0.8000)	-0.1076 [0.8999] (-0.1200)
Constant	0.0292 [0.0314] (0.9300)	-0.1686 [0.0964] (-1.7500)
F-test (4, 383)	2.1500*	3.4000**
Wald Test ( $\chi^2_4$ )	41.6500**	22.4900**
Hausman Test ( $\chi^2_4$ )	12.0500	3.7200
F-test (4,27) (clustered), Wald Test ( $\chi^2_4$ ) (clustered)	70.3800**	430.3300**
Number of observation	415	415
Number of group	28	28

Notes: Numbers in brackets [.] are clustered standard errors. Numbers in parentheses (.) in the column of  $\Delta \ln GDP_{it}$  are t statistics. Numbers in parentheses in the column of  $\Delta Mil_{it}$  are Z statistics. \* denotes significance level at 10%. \*\* denotes significance level at 5%.

It is hypothesized that the lagged GDP growth has a positive effect on the current GDP growth. The study result supports this hypothesis. It seems that current

GDP growth is influenced by lagged investment. The study result indicates that if the lagged GDP growth increases by 1%, the current GDP growth will increase by 0.34%.

Theory suggests that the share of investment in GDP has a positive effect on GDP growth. However, the study result shows an insignificant relationship between the share of investment in GDP and the growth of GDP at a 5% level of confidence. The insignificance implies that the economic growth of these countries does not depend on their own capital stock. This might be because these countries utilize capital from foreign investment. In addition, it is possible that, rather than the current share of investment, the growth of GDP is influenced by the lagged share of investment. Although it is insignificant, a positive sign for the coefficient implies that when the share of investment in GDP increases, the growth of GDP tends to increase.

It is conjectured that population growth has a negative effect on economic growth in oil exporting but arms importing countries. The study result, however, shows that population growth insignificantly affects economic growth at a 5% level of confidence. This implies that, perhaps the effect of population may not depend only on number but also age structure. In addition, it is possible that the economic growth of these countries is not influenced by their population growth because they employ foreign labour. A negative sign of the coefficient implies that when the population increases, the growth of GDP of these countries tends to decrease.

Next, the impact of the regressors on the share of military expenditure is examined using the model in equation (57a). Again, the fixed effects model and test are performed (Table 13). With the F-statistic of 3.400 (with 4 and 383 degree of freedom), the  $H_0$  that all the coefficients of the cross-section are equal to zero at a 5% level is rejected. It implies that at least one of the regressors affects the share of military expenditure. Then, the random effects model is tested and Wald's test is performed. The result of the Wald test indicates that the share of military expenditure is affected by the regressors. Hausman's test is performed to specify whether a fixed or a random effects model is more appropriate. The result suggests that the random effects model might be more appropriate. Hence, the

random effects model is used for the investigation. Clustered standard errors at the country level are used to correct for the presence of heteroscedasticity of unknown form.

The third column of Table 13 displays the impacts of independent variables on the share of military expenditure in GDP. Theory suggests that the lagged GDP growth positively affects the current share of military expenditure in GDP. The study result, however, shows an insignificant relationship between the lagged GDP and the current share of military expenditure at a 5% level confidence. This implies that the share of military expenditure of oil exporting but arms importing countries may not be driven by GDP growth. In other words, these countries spend on military expenditure regardless of GDP growth. Although it is insignificant, a positive sign of the coefficient implies that the governments of these countries tend to spend more on military expenditure when the lagged GDP growth increases, maybe because security is a crucial issue for these countries.

It is conjectured that the lagged share of military expenditure in GDP has a negative effect on current share of military expenditure in GDP. However, the study result shows that the lagged share of military expenditure in GDP has a significantly positive effect on the current share of military expenditure in GDP at a 5% level of confidence. This might be because, in oil exporting but arms importing countries, war or security is an important issue and the bargaining power of the military sector is strong. Therefore, the share of military expenditure in GDP growth depends on the bargaining power of the military sector, rather than economic reasons. The result indicates that if the lagged share of military expenditure increases by 1%, the current share of military expenditure will increase by 0.16%.

Theoretically, the share of investment in GDP has a negative effect on the share of military expenditure in GDP. However, the study result indicates that the impact of the share of investment on the share of military expenditure is insignificant at a 5% level of confidence. This implies that the share of military expenditure of oil exporting but arms importing countries may not be driven by the current share of investment in GDP. This might be because security is an important issue for these countries. A



positive sign of the coefficient, although it is insignificant, implies that if capital stock increases, governments tend to increase the share of military expenditure, perhaps in order to secure increased capital stock.

Similar to the case of arms and oil importing countries, theory suggests that population growth has a positive impact on the share of military expenditure in GDP. However, the study result shows an insignificant relationship at a 5% level of confidence. The sign of the coefficient is negative, although it is insignificant. This is possible because when the population increases, governments may increase all public services, not only military expenditure, but also non-military government expenditure. It is possible that governments allocate resources for non-military government expenditure, such as health care and education services, more than for military expenditure.

### **3.5.5 Conclusion**

This part uses the time period of data from 1992 to 2013 to examine the relationship between military expenditure and economic growth in 28 oil exporting but arms importing countries. The motivation for focusing on this group of countries is their special characteristics, and there has been no study focusing on oil exporting but arms importing countries.

The study result is distinct from that of arms and oil importing countries. The share of military expenditure has a significantly negative effect on economic growth in oil exporting but arms importing countries. This result indicates the crowding-out effects of military expenditure. It is found that lagged GDP growth has a positive effect on current GDP growth. It is also found that the share of investment and population growth affect economic growth, but insignificantly. This implies that the economic growth of these countries may not depend on their own capital stock and population growth. This might be because these countries utilize capital from foreign investment and imports.

Similar to the study result of arms and oil importing countries, it is found that, for oil exporting but arms importing countries, governments spend on military expenditure regardless of GDP growth. The sign of the coefficient for GDP growth is positive, although it is insignificant. This implies that if the GDP increases, governments tend to increase the share of military expenditure, perhaps because security is a crucial issue for these countries. Additionally, no evidence supports the idea that the share of investment and the growth population affect the share of military expenditure.

### **3.6 Military expenditure and economic growth in arms exporting countries**

#### **3.6.1 Motivation and objective**

The aim of this part is to examine the relationship between military expenditure and economic growth in 24 arms exporting countries using unbalanced panel data over the time period from 1992 to 2013. The motivation for focusing on arms exporting countries is their special characteristics and their important roles in world peace. They have defense industries. They export arms to countries all over the world, and they spend a large amount of money on military expenditure. Since the impacts of military expenditure of arms exporting countries might go far beyond economic growth in their own countries, it is necessary to know the accurate effect of military expenditure. Furthermore, although a number of studies on the economic impact of military expenditure have been conducted, there is no study focusing on arms exporting countries, especially in the 2000s.

A similar study is Kollias et al. (2007). They used panel data of the EU15 group of countries for the time period 1961-2000 to examine the relationship between military expenditure and economic growth. They concluded that there is a positive relationship between economic growth and military expenditure in the long run and a positive impact of military expenditure on economic growth in the short run. However, although 10 of these 15 countries are in the list of arms exporting countries, the study result of this group of countries is not representative of all arms exporting countries. The study

does not include Poland, Norway, Switzerland, Ukraine, Belarus and arms exporting countries in other regions like America, Asia and Africa. Furthermore, the sample of this part covers 24 conventional arms exporting countries around the globe.

### 3.6.2 Methodology

This section employs panel data since they have several advantages compared to other techniques. They can be applied to measure the individual changes in a set of variables directly (Dunne and Perlo-Freeman, 2003). In addition, this section employs recursive VAR models because they are suitable for causality analysis (Finkel, 1995). In these models, the lagged value of the dependent variable, a series of independent variables, and a serially uncorrelated error term are used as independent variables.

To formulate the model to investigate the relationship between military expenditure and economic growth, this part applies the Barro growth model to specify the variables in the model. Let  $GDP_{it}$ ,  $Mil_{it}$ ,  $Pop_{it}$ , and  $Inv_{it}$  denote the real GDP, the share of military expenditure in GDP, the number of population, and the share of investment in GDP of country  $i$  at time  $t$ , respectively. In this thesis, the share of investment in GDP is a proxy for capital good, and the population growth is a proxy for labor input. Let  $\varepsilon_{yit}$ , and  $\varepsilon_{milit}$  be error terms and are assumed serially uncorrelated error terms. Take the natural log of  $GDP_{it}$  and  $Pop_{it}$ . After that, set the differentiated forms of the natural log of GDP and the natural log of population.

Since the time dimension of the panel is not large, this part therefore considers the maximum of 2 lags. There are many methods to determine the lagged length to include in each equation, such as the Akaike information criterion (AIC), the Schwarz information criterion, the Bayes information criteria (BIC), and the Hannan and Quinn criterion (HQC). In this part, the lagged length is selected by the HQC criterion. Given the common optimal lag length is 1, the relationship between military expenditure and economic growth can take the following form:

$$\Delta \ln GDP_{it} = \alpha_0 + \alpha_1 \Delta \ln GDP_{it-1} + \alpha_2 Mil_{it-1} + \alpha_3 Inv_{it} + \alpha_4 \Delta \ln Pop_{it} + \varepsilon_{yit} \quad (58)$$

$$Mil_{it} = \beta_0 + \beta_1 \Delta \ln GDP_{it-1} + \beta_2 Mil_{it-1} + \beta_3 Inv_{it} + \beta_4 \Delta \ln Pop_{it} + \varepsilon_{milit} \quad (59)$$

where  $GDP_{it}$  = real GDP of country  $i$  at time  $t$  (unit: local currency)

$Mil_{it}$  = a share of military expenditure in GDP of country  $i$  at time  $t$  (unit: %)

$Inv_{it}$  = the share of investment in GDP of country  $i$  at time  $t$  (unit: %)

$Pop_{it}$  = Number of population of country  $i$  at time  $t$  (unit: persons)

$\alpha_0, \beta_0$  = constant

$\alpha_1, \alpha_2, \alpha_3, \alpha_4, \beta_1, \beta_2, \beta_3,$  and  $\beta_4$  = coefficients

$\varepsilon$  = error term

$i$  = 24 arms exporting countries

$t$  = 1992, ..., 2013 (It should be noted that the panel data in this part are unbalanced because the data for some countries are not available in some periods of time.).

As previously stated, the presence of the lagged values of  $\Delta \ln GDP_{it}$  and  $Mil_{it}$  allow us to analyze explicitly the changes in  $\Delta \ln GDP_{it}$  and  $Mil_{it}$  over time (Kollias et al., 2007). If the lagged variable of  $Mil_{it}$  associates with changes in  $\Delta \ln GDP_{it}$ , there is a causal effect from  $Mil_{it}$  to  $\Delta \ln GDP_{it}$ .

Since the lagged independent variables  $\Delta \ln GDP_{it}$  in Equation (58) and  $Mil_{it}$  in Equation (59) are correlated with the error terms, the estimators are biased (Anderson and Hsiao, 1982). According to Nickell (1981), this bias approaches zero as the time dimension (T) is large. Nonetheless, the time dimension is not large; therefore the problem of the biased estimator must be rectified.  $\Delta \ln GDP_{it-2}$  and  $Mil_{it-2}$  are used as instrumental variables for  $\Delta \ln GDP_{it-1}$  and  $Mil_{it-1}$ , respectively.

This part employs panel data of 24 arms exporting countries; Belarus, Belgium, Brazil, Canada, China, Czech Republic, Denmark, Finland, France, Germany, Israel, Italy, Netherlands, Norway, Poland, Russia, South Africa, South Korea, Spain, Sweden, Switzerland, Ukraine, the United Kingdom, and the United States, over the time period

from 1992 to 2013. According to SIPRI (2014b), from 1992 to 2013 there were 27 arms exporting countries. However, this part excludes Czechoslovakia, North Korea and Uzbekistan from the analysis because the data are not available. It should be noted that the panel data in this part are unbalanced because the data for some countries are not available in some periods of time. After the adjustment, i.e. using the instrument variables, there are 407 observations for investigation.

This part uses the secondary data of arms exporting countries obtained from various sources. Nominal Gross Domestic Product, share of government spending, share of investment, inflation rate and number of population are obtained from the IMF (2014). Arms transfers and share of military expenditure in GDP are obtained from Stockholm-International-Peace-Research-Institute (2012). The list of arms importing countries is obtained from SIPRI (2014a). The list of oil exporting countries is obtained from the Association for the Study of Peak Oil & Gas USA (2014).

### **3.6.3 Theoretical framework for arms exporting countries**

According to Equation (58), although an increase in the lagged share of military expenditure might lead to a decrease in the lagged share of investment in GDP, the lagged share of military expenditure in GDP should have a positive effect on GDP growth in arms exporting countries. This is because these countries have defense industries. Therefore, an increase in the share of military expenditure might encourage employment in defense industries, as well as related industries. Moreover, military expenditure might be used for research and development in the defense industry. Then, the results of R&D might spill over to the civilian sector, and hence encourage economic growth.

It is hypothesized that lagged GDP growth positively affects current GDP growth. This is because lagged GDP growth might capture the effect of lagged private investment, and therefore affects the current GDP growth.

Theory suggests that the share of investment in GDP has a positive effect on GDP growth. This is because increasing the share of investment reduces resource unemployment in the civilian sector.

Population growth is conjectured to have an immediate negative effect on economic growth in arms exporting countries. This is because raising children needs more food, health care services, education services, and so forth. Raising children may immediately reduce saving propensity, as well as potential investments. However, in the long-run, when children grow up they become workers and consumers and positively affect economic growth.

According to Equation (59), it is possible that lagged GDP growth has a positive effect on the current share of military expenditure in GDP. The reason is that, when GDP growth increases the government might increase military expenditure, as well as other public services.

The lagged share of military expenditure in GDP should have a positive effect on the current share of military expenditure in GDP in arms exporting countries. For these countries, military expenditure, at least partially, is used for war participation in foreign countries. An increase in the lagged share of military expenditure might be caused by the prediction of war participation. Since arms exporting countries anticipate prolonged wars, governments need to allocate more money to military expenditure. Therefore, when the lagged share of military expenditure increases, the current share of military expenditure also increases.

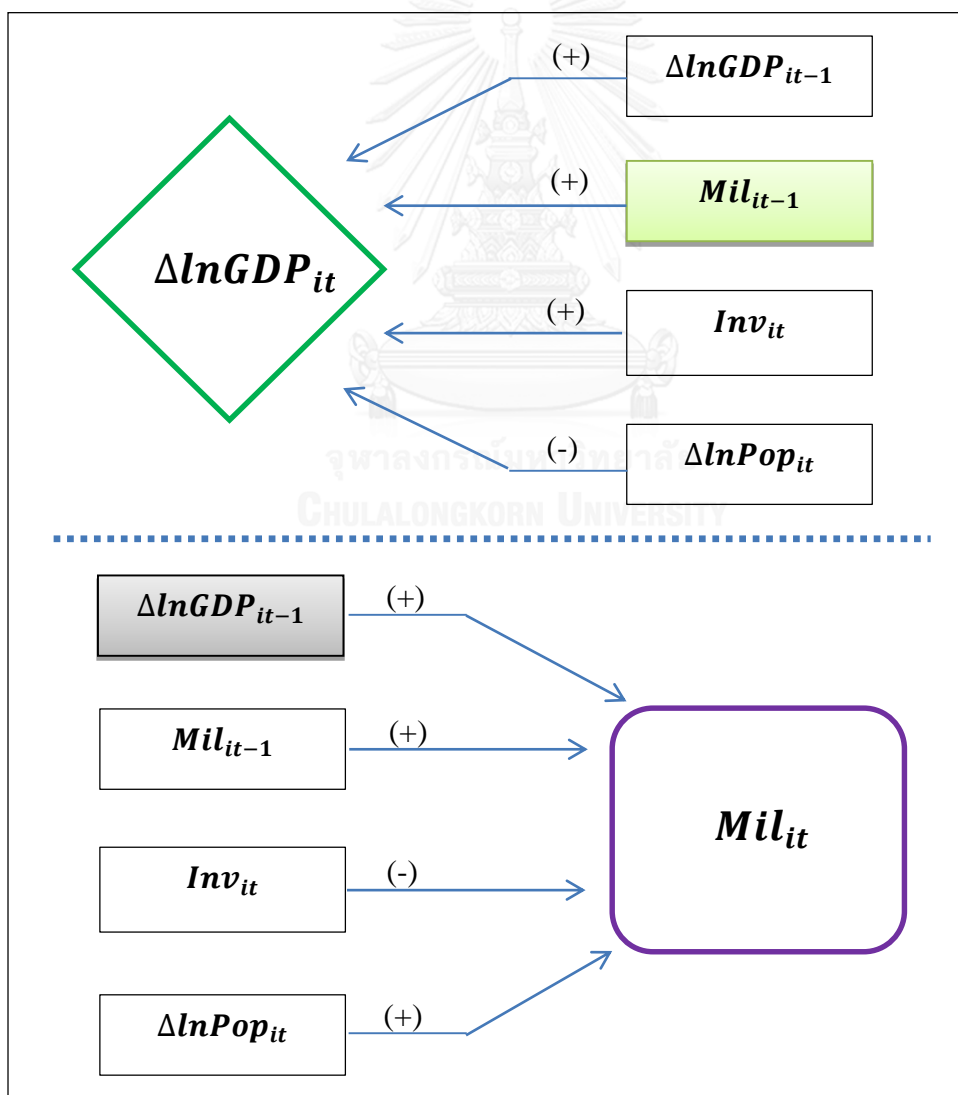
It is conjectured that the share of investment in GDP has a negative effect on the share of military expenditure in GDP. The reason is that an increase in the share of investment leads to a decrease in the share of military expenditure, given that other factors remain unchanged.

It is hypothesized that population growth has a positive impact on the share of military expenditure in GDP in arms exporting countries. This is because when the

population increases, the government spends more money on public services, as well as military services.

In conclusion, Figure 9 displays the expected relationship between variables for arms exporting countries. Different from other groups of countries, it is conjectured that the lagged share of military expenditure in GDP should have a positive effect on GDP growth. Furthermore, lagged share of military expenditure in GDP is conjectured to have a positive effect on the current share of military expenditure in GDP.

Figure 9 The expected relationship between dependent and independent variables for arms exporting countries



### 3.6.4 Analysis and discussion of the empirical results

Before investigating the relationship between military expenditure and economic growth in arms exporting countries, the stationarity assumption is tested. The panel unit root test, which was developed by Maddala and Wu (1999), is adopted for testing. Firstly, the ADF unit root test for each country is conducted. After that, we calculate the test using Equation (53).

$$\lambda = -2 \sum_{i=1}^N \ln(\rho_i) \sim \chi^2(2N) \quad (53)$$

where  $p_i$  are the probability values of the ADF(1) test with constant but without trend for individual variables and countries. They are the MacKinnon approximate p-value for Z test. Probabilities that equal 0.0000 are adjusted to be 0.0001 in order to enable calculation of  $p_i$ . Maddala and Wu's (1999) panel unit root test statistic follows a  $\chi^2$  with  $2N$  degree of freedom. The estimates of the panel unit root statistics for all variables and countries are presented in Table 14. The  $\lambda$  statistic shows that *Mil* and *Inv* are stationary at levels for the panel, whereas *lnGDP* and *lnPop* are stationary at the first difference level.

Next, instrumental variables are employed to deal with the correlation between  $\Delta \ln GDP_{it-1}$ ,  $Mil_{it-1}$ , and the error terms. The instrument variables are *Estimated  $\Delta \ln GDP_{it-1}$*  and *Estimated  $Mil_{it-1}$* . After that, the time series structures of the residuals are analyzed. The result shows that they are AR(1) structures.

The next step is to investigate the impact of the regressors on economic growth in arms exporting countries. Equation (58) is employed for the investigation. First of all, the fixed effects model is examined. As can be seen from Table 15, with the F-statistic of 4.09 (with 4 and 379 degree of freedom) for GDP growth, the  $H_0$  that all the coefficients of the cross-section are equal to zero at a 5% significance level is rejected. The finding indicates that at least one of the regressors affects economic growth in arms exporting countries. Then, the random effects model is examined. Wald's test is performed. The Wald test is the test for the joint significance of the estimated coefficients, which is distributed as a  $\chi^2$  under the  $H_0$  of no relationship. The result of Wald's test indicates that the regressors in the model affect



Table 14 Panel Unit Root Test ( $P_i$  Values) for arms exporting countries

No.	Country	Levels				First Difference			
		lnGDP	Mil	Inv	lnPop	lnGDP	Mil	Inv	lnPop
1	Belarus	0.7218	0.0341	0.8025	0.0010	0.0138	0.0707	0.0557	0.8506
2	Belgium	0.0607	0.4672	0.0338	0.9974	0.1704	0.0033	0.0022	0.5898
3	Brazil	0.4504	0.2229	0.2112	0.3308	0.1923	0.0001	0.0005	0.6920
4	Canada	0.4107	0.1963	0.5871	0.9991	0.0461	0.0110	0.0446	0.2287
5	China	0.8229	0.3683	0.7887	0.9840	0.3704	0.0050	0.0621	0.0001
6	Czech Republic	0.1857	0.9668	0.7326	0.4946	0.6806	0.1315	0.0226	0.3043
7	Denmark	0.2928	0.4151	0.3190	0.9693	0.1424	0.0267	0.0225	0.3520
8	Finland	0.0400	0.0370	0.0238	0.9959	0.0656	0.0343	0.0007	0.8698
9	France	0.0770	0.3423	0.0903	0.4747	0.1032	0.0449	0.0006	0.2802
10	Germany	0.6637	0.3060	0.6438	0.9052	0.0001	0.0003	0.0019	0.0718
11	Israel	0.8964	0.7323	0.0002	0.9143	0.3382	0.0001	0.0078	0.0001
12	Italy	0.3703	0.9384	0.8752	0.9833	0.4810	0.1666	0.0449	0.2723
13	South Korea	0.0517	0.8006	0.0693	0.8222	0.0389	0.0125	0.0001	0.1599
14	Netherlands	0.2796	0.6120	0.6904	0.7219	0.2271	0.0033	0.1282	0.0023
15	Norway	0.7972	0.5375	0.3469	0.9949	0.0035	0.0005	0.0217	0.7669
16	Poland	0.8404	0.2192	0.0355	0.1032	0.3173	0.0006	0.0078	0.0291
17	Russia	0.5009	0.2018	0.0474	0.2381	0.1713	0.0417	0.0002	0.8508
18	South Africa	0.4439	0.6688	0.3267	1.0000	0.3069	0.0562	0.4466	0.9433
19	Spain	0.0304	0.4744	0.5340	0.0137	0.7307	0.0995	0.5029	0.7806
20	Sweden	0.3260	0.1616	0.0596	0.9636	0.0287	0.0310	0.0001	0.7029
21	Switzerland	0.9297	0.0256	0.2794	0.9888	0.0181	0.7056	0.0032	0.2563
22	Ukraine	0.4566	0.0453	0.5130	0.5825	0.1469	0.0159	0.0341	0.9964
23	United Kingdom	0.2035	0.0037	0.8117	0.9989	0.5350	0.0450	0.0058	0.3698
24	United States	0.3195	0.1071	0.4890	0.3073	0.1742	0.1987	0.1601	0.6932
$\lambda$		59.1250	74.2496 **	81.0762 **	40.0342	113.5442 **	209.5673 **	228.5228 **	87.5824 **
$\chi^2(48)$ CV(5%)		65.1708							

Notes: \*\* denotes significance level at 5%. CV(5%) denotes the corresponding 5% critical value.

GDP growth. Then, the Hausman test is employed to select the best model. The Hausman test is distributed as  $\chi^2$  with the degrees of freedom equal to the number of regressors under the  $H_0$  of difference in coefficients not systematic. The result suggests that the random effects model might be more appropriate. Therefore, the random effects model is used for the investigation. Clustered standard errors at the country level are used to correct for the presence of heteroscedasticity of unknown forms.

Table 15 presents the estimation results of the dynamic random effects models. It is conjectured that the lagged share of military expenditure in GDP should have a positive effect on GDP growth in arms exporting countries. The study result confirms the conjecture. It is shown that the share of military expenditure has a significantly positive effect on economic growth in arms exporting countries. The result indicates that if the share of military expenditure increases by 1%, the growth of GDP will increase by 63.80%. This study uses data from both economically developed and developing arms exporting countries from

Table 15 Random-effects GLS estimation results for arms exporting countries (sample 1992-2013)

	$\Delta \ln GDP_{it}$	$Mil_{it}$
$\Delta \ln GDP_{it-1}$		-0.0040 [0.0037] (-1.0800)
<i>Estimated</i> $\Delta \ln GDP_{it-1}$	0.2859** [0.0486] (5.8800)	
$Mil_{it-1}$	0.6380** [0.1803] (3.5400)	
<i>Estimated</i> $Mil_{it-1}$		0.9665** [0.0110] (87.8300)
$Inv_{it}$	0.2035** [0.0674] (3.0200)	0.0029 [0.0021] (1.4000)
$\Delta \ln Pop_{it}$	-0.7084 [0.4168] (-1.7000)	-0.0369 [0.0239] (-1.5500)
Constant	-3.5618** [1.3114] (-2.7200)	0.0026 [0.0415] (0.0600)
F-test (4, 379)	4.0900**	117.3000**
Wald Test ( $\chi^2_4$ )	80.4700**	10049.5200**
Hausman Test ( $\chi^2_4$ )	6.2600	3.6900
Wald Test ( $\chi^2_4$ ) (clustered)	576.3200**	9313.0300**
Number of observation	407	407
Number of group	24	24

Notes: Numbers in brackets [.] are clustered standard errors. Numbers in parentheses (.) are Z statistics. \*\* denotes significance level at 5%.

various regions over the period from 1992 to 2013. The finding, however, is in accord with Kollias et al. (2007) who used data from the EU15 group of countries for the time period from 1961 to 2000. Adjusting the sample and changing the time period did not affect the result of Kollias et al. (2007). This finding also does not oppose the conclusion of Alptekin and Levine (2012). They concluded that the hypothesis of a negative military expenditure-growth relationship is not supported for both less developed countries and in general, and a positive effect of military expenditure on economic growth is supported for developed countries.

With regard to the impact of lagged GDP growth, it is hypothesized that lagged GDP growth positively affects current GDP growth. The study result supports this hypothesis. It is found that lagged GDP growth has a significant positive effect on current GDP growth at a 5% level of confidence. The result indicates that if lagged GDP growth increases by 1%, current GDP growth will increase by 28.59%.

Theory suggests that the share of investment in GDP has a positive effect on GDP growth. The result shows that the share of investment has a significantly positive impact on economic growth at a 5% level of confidence. That means capital stock is instrumental to economic growth in arms exporting countries. This might be because most arms exporting countries are technologically developed countries. The result implies that if share investment increases by 1%, GDP will increase by 20.35%.

It is conjectured that population growth has a negative impact on economic growth in arms exporting countries. However, the study result shows that the impact of population growth on GDP growth is insignificant at a 5% level of confidence. Although it is insignificant, the negative sign of the coefficient of population growth indicates that if the growth of population increases, GDP growth is likely to decrease.

Next, we investigate the impact of the regressors on the share of military expenditure using the model in Equation (59). Again, the fixed effects model and F test (Table 15) are performed. With an F-statistic of 117.30 (with 4 and 379 degree of freedom), the  $H_0$  that all the coefficients of the cross-section are equal to zero at a 5% level is rejected. As a consequence, it is concluded that at least one of the regressors affects the share of military expenditure in arms exporting countries. Then, the random effects model and Wald's test are performed. The result of the Wald test indicates that the share of military expenditure is affected by the regressors. The Hausman test is used to specify whether a fixed or a random effects model is more appropriate. The result suggests that the random effects model might be more appropriate. Hence, the random effects model is used for the investigation. Clustered standard errors at the country level are used to correct for the presence of heteroscedasticity of unknown form.

The impacts of independent variables on the share of military expenditure in arms exporting countries are shown in Table 17. It is hypothesized that lagged GDP growth has a positive effect on the current share of military expenditure in GDP. The study result, however, shows that the relationship between lagged GDP growth is insignificant at a 5% level of confidence. This implies that arms exporting countries spend on military expenditure regardless of GDP growth. This finding is compatible with Kollias et al. (2007) who used a different sample. Although it is insignificant, the sign of the coefficient is negative. This might be because when lagged GDP growth increases, governments increase military expenditure, as well as other public services such as health and education. It is possible that even though the volume of military expenditure increases, the share of military expenditure in GDP does not increase because non-military government expenditure also increases.

It is conjectured that the lagged share of military expenditure in GDP has a positive effect on the current share of military expenditure in GDP in arms exporting countries. The study result supports this conjecture. It is indicated that if the lagged share of military expenditure increases by 1%, the current share of military expenditure will increase by 0.96%.

Theoretically, the share of investment in GDP should have a negative effect on the share of military expenditure in GDP in arms exporting countries. However, the study result indicates the impact of the share of investment on the share of military expenditure is insignificant at a 5% level confidence. Although it is insignificant, the sign of the coefficient is positive. This finding indicates that governments may increase the share of military expenditure in order to secure increased capital stock.

Population growth is conjectured to have a positive impact on the share of military expenditure in GDP in arms exporting countries. However, the study result shows that the relationship is insignificant at a 5% level of confidence. This implies that the governments of these countries spend on military expenditure regardless of population growth. Although it is insignificant, the sign of the coefficient is negative. The study result opposes the conjecture. This is possible because when the population

growth increases, governments may increase all public services, not only military expenditure but also other non-military government expenditure. Hence, the share of military expenditure in GDP may not increase.

### 3.6.5 Conclusion

This part uses the time period of data from 1992 to 2013 to examine the relationship between military expenditure and economic growth in 24 arms exporting countries. The motivation for focusing on this group of countries is their special characteristics and their important roles in world peace and because there has been no study focusing on arms exporting countries.

The study result shows that the share of military expenditure has a significantly positive effect on economic growth in arms exporting countries. The result indicates the demand side effects of military expenditure on the increase in resource employment in defense industries. Because arms exporting countries have defense industries, increasing military expenditure may encourage resource employment in defense industries. In addition, increases in research and development in defense industries might contribute to the supply side effect. It might lead to higher technology of armaments and hence encourage economic growth. Moreover, military expenditure might affect economic growth through security channels. Increases in security may enhance confidence and contribute to the creation of a stable and secure environment conducive to economic activity. It is also found that the share of investment has a significantly positive impact on economic growth. This finding supports the fact that most arms exporting countries are technologically developed countries, thus capital stock is instrumental to economic growth in arms exporting countries. Furthermore, no evidence supports the idea that population growth affects economic growth in these countries.

It is found that the share of military expenditure is insignificantly affected by GDP growth. This implies that arms exporting countries spend on military expenditure regardless of GDP growth. The negative sign of the coefficient of GDP growth means that arms exporting countries may decrease the share of military expenditure when GDP

growth increases. Furthermore, the study result indicates that the share of investment and the growth of population insignificantly affect the share of military expenditure in arms exporting countries. The positive sign of the coefficient of the share of investment implies that if capital stock increases, the governments of these countries may increase the share of military expenditure whereas a negative sign of the coefficient of the growth of population implies that the share of military expenditure may decrease if the population increases.

### 3.7 Summary

This chapter uses data from 1992 to 2013 to examine the relationship between military expenditure and economic growth in three groups of countries; 94 arms and oil importing countries, 28 oil exporting but arms importing countries, and 24 arms exporting countries. Panel VAR models for each group of countries are employed. The motivation for focusing on these groups of countries is their special characteristics and because there has been no study focusing on each group, especially in the 2000s. The relationship between the regressants and regressors are summarized in Table 16.

According to Table 16, the share of military expenditure has a negative impact on GDP growth in arms importing countries, although the impact is insignificant for arms and oil importing countries. On the other hand, it has a positive impact on GDP in arms exporting countries.

Theoretically, the lagged share of military expenditure has a negative effect on GDP growth in arms importing countries. The reason that supports this is when the lagged share of military expenditure increases, the lagged share of investment in GDP may decrease. Since the productivity of resources in the military sector is lower than that of the civilian sector, an increase in the share of military expenditure might negatively affect GDP growth. Furthermore, since arms importing countries do not have defense industries, military expenditure may neither encourage resource employment nor military technology development, but may encourage imports of weapons. This theory is supported by the study

Table 16 The impacts of independent variables on GDP growth and the share of military expenditure for each group of country (sample 1992-2013)

	Arms and oil importing countries	Oil exporting but arms importing countries <sup>/1</sup>	Arms exporting countries
$\Delta \ln GDP_{it}$			
<i>Estimated <math>\Delta \ln GDP_{it-1}</math></i>	+ **	+ **	+ **
<i>Mil<sub>it-1</sub></i>	—	— **	+ **
<i>Inv<sub>it</sub></i>	+ **	+	+ **
<i><math>\Delta \ln Pop_{it}</math></i>	+	—	—
$Mil_{it-1}$			
<i><math>\Delta \ln GDP_{it-1}</math></i>	—	+	—
<i>Estimated <math>Mil_{it-1}</math></i>	+ **	+ **	+ **
<i>Inv<sub>it</sub></i>	—	+	+
<i><math>\Delta \ln Pop_{it}</math></i>	+ **	—	—

Notes: + denotes a positive impact. — denotes a negative impact. \*\* denotes significance level at 5%. <sup>/1</sup>For oil exporting but arms importing countries,  $\Delta Mil_{it-1}$  are used as variables instead of  $Mil_{it-1}$ .

In the case of arms exporting countries, the share of military expenditure has a significantly positive effect on economic growth. Although an increase in the share of military expenditure may lead to a decrease in the share of investment, because these countries have defense industries, an increase in the share of military expenditure might encourage employment in defense industries, as well as related industries. In addition, military expenditure might be used for research and development in the defense industry, and new technology might spill over into the civilian sector, and hence encourage economic growth.

Theory suggests that lagged GDP growth has a positive effect on current GDP growth. This is because lagged GDP growth may seize the effects of the lagged share of private investment, which may influence current GDP growth. The study result

shows a positive relationship between the lagged and current GDP growths for every group of countries. However, the relationship is insignificant for arms and oil importing countries. Perhaps for this group of countries, the current GDP growth is influenced by current private investment rather than lagged private investment.

Theory suggests that the share of investment in GDP has a positive effect on GDP growth. This is because an increase in the share of investment leads to an increase in resource employment, and hence positively affects economic growth. The study result shows that the share of investment has a positive impact on economic growth in all groups of countries. However, the relationship is insignificant for oil exporting but arms importing countries perhaps because these countries mainly utilize capital from foreign investment.

Theory suggests that population growth has an immediately negative impact on economic growth. This is because raising children needs more food, health care services, education services, and so forth. Raising children may immediately reduce saving propensity and lower potential investments. However, when children grow up, they become workers and consumers and positively affect economic growth. The study result shows an insignificant relationship between population growth and economic growth in all groups of countries. Perhaps, economic growth does not depend only on the size of the population, but also on the age structure of the population.

Theoretically, the share of military expenditure is positively affected by lagged GDP growth. This is because when GDP growth increases, governments might increase public services, as well as military services. Hence, the share of military expenditure increases. The study result, however, shows an insignificant relationship between these variables for all groups of countries. This implies that the share of military expenditure is not driven by GDP growth in the past. In other words, governments spend on military expenditure regardless of GDP growth. The sign of the coefficient varies. This maybe because when lagged GDP growth increases, governments may increase military expenditure, as well as other public services such as health, education, and communication services. It is possible that even though the volume of military expenditure increases, the share of military expenditure in GDP may not increase



because non-military government expenditure also increases. The study results indicate that lagged GDP growth has a positive relationship with the share of military expenditure in oil exporting but arms importing countries. Furthermore, it has a negative relationship in arms and oil exporting countries, as well as arms exporting countries. For oil exporting but arms importing countries, for which security issues are important, when GDP growth increases, governments may increase military expenditure more than non-military government expenditure. Therefore, lagged GDP growth positively affects the share of military expenditure, although it is insignificant.

The lagged share of military expenditure in GDP is conjectured to have a negative effect on the current share of military expenditure in GDP. This is because when the lagged share of military expenditure increases, the lagged share of investment in GDP may decrease, and hence the lagged GDP growth decreases. Because the current share of military expenditure in GDP is conjectured to decrease when the lagged GDP growth decreases, the current share of military expenditure decreases when the lagged share of military expenditure increases. However, the study result shows that the lagged share of military expenditure has a significant positive effect on the current share of military expenditure for all groups of countries. This might be because the share of military expenditure depends on other factors, such as political factors, the bargaining power of the military sector, etc., rather than economic reasons.

Theory suggests that the share of investment in GDP has a negative effect on the share of military expenditure in GDP. This is because, given that other factors remain unchanged, an increase in the share of investment in GDP leads to a decrease in the share of military expenditure in GDP. The study result shows an insignificant relationship between the share of investment and the share of military expenditure for all groups of countries. This finding might derive from the fact that the share of military expenditure in GDP growth depends on factors like political factors and the power of the military sector. Therefore, when the share of private investment increases, the share of military expenditure in GDP may or may not decrease. The result, however, reveals that the share of investment has a positive relationship with the share of military expenditure in oil exporting but not in arms importing countries, and arms exporting

countries. This might be because governments increase the share of military expenditure in order to secure increased capital stock. In the case of oil exporting countries, important industries, such as the oil industry, are controlled by governments. Maybe the governments tend to increase the share of military expenditure when they increase their capital stock.

When the population increases, the government may provide more public services, as well as military services; therefore, it is conjectured that population growth has a positive impact on the share of military expenditure. The study result reveals that population growth positively and significantly affects military expenditure in arms and oil importing countries. In contrast, the impact of the growth of population on the share of military expenditure is insignificant in oil exporting countries, as well as arms exporting countries. This is possible because when the population growth increases, the governments may increase all public services; not only military expenditure, but also other non-military government expenditure.

## **Chapter 4**

### **The United States and Global Wars**

#### **4.1 Introduction**

The United States has an important role in world conflicts. It is one of five permanent members of the United Nation Security Council. It is also a member of the North Atlantic Treaty Organization (NATO). As the largest arms exporting country, it has been involved a number of wars indirectly by exporting a large number of weapons. In addition, it has engaged in, both officially and unofficially, many armed conflicts around the globe. In order to understand its behavior in regard to global wars, it is important to understand its military background. Therefore, the aims of this chapter are to 1) study the United States' defense industry 2) illustrate the United States' involvement in armed conflicts in foreign countries 3) study the relationship between the United States and its military allies; Israel, Germany and Japan, as well as the importance of world military alliances; the United Nations Security Council and NATO, and 4) investigate the relationship between the start of participation in a major war and the economic situation in six military superpower countries; the United States, the United Kingdom, France, Russia, China and Germany.

There are eight parts in this chapter. The first part is the introduction. The second part is the limitations. The third part is the methodology used in this chapter. The fourth part describes the importance of the US defense industry. The fifth part illustrates the United States' engagement in armed conflicts in foreign countries. The sixth part explains the relationship between the United States and its allies, and a brief description about the UN Security Council and NATO. The seventh part investigates the relationship between the start of participation in a major war and economic growth in the six military superpower countries. Lastly, the eighth part is a summary.

#### **4.2 Limitations**

1) In this thesis, the number of wars is not the total number of wars. It includes only official engagements. In addition, the definition of war in this thesis is a conflict that concerns the usurpation of power or the right to rule over a territory between the armed forces of two parties, of which at least one side is the government of a state, and results in at least 25 battle-related deaths per year. It excludes armed conflicts that result in less than 25 battle-related deaths per year or armed conflicts between two parties where neither is the government of a state.

2) The volume of US arms transfers in this thesis is recorded by Trend Indicator Values. This volume includes both in kind and in money transferred arms. However, this volume excludes arms trade in the black and gray markets. Furthermore, US arms in this thesis include only conventional weapons. They exclude small weapons, chemical weapons, and nuclear weapons.

### **4.3 Methodology**

This chapter employs secondary data obtained from various sources. The list of arms recipient countries and arms transfers are obtained from SIPRI (2014a; 2014d). US arms export policies, US defense industry and information about the relationship between the United States and its allies are obtained from literature. The list of wars is obtained from Uppsala Universitet (2014), Grossman (2012), Global-Policy-Forum (2005), World Statemen.org (n.d.), Washington's Blog (2015), Utah University (2015), Conetta (2003), and Brown University (2015a; 2005b). The location of each country is identified by the World Factbook of the Central Intelligence Agency (n.d.). The military expenditure of the United States is obtained from the Office of the Under Secretary of Defense cited by Cordesman and Peacock (2015). Finally, the GDP growth figures of the military superpower countries are obtained from the World Bank (2015a).

Descriptive statistics; frequency and percentage, are used to describe the trends of arms transfers between 1950 and 2013 and US military intervention in foreign countries between 1946 and 2010. The importance of the United States' defense industry, as well as the relationship between the United States and its allies, is analyzed using the

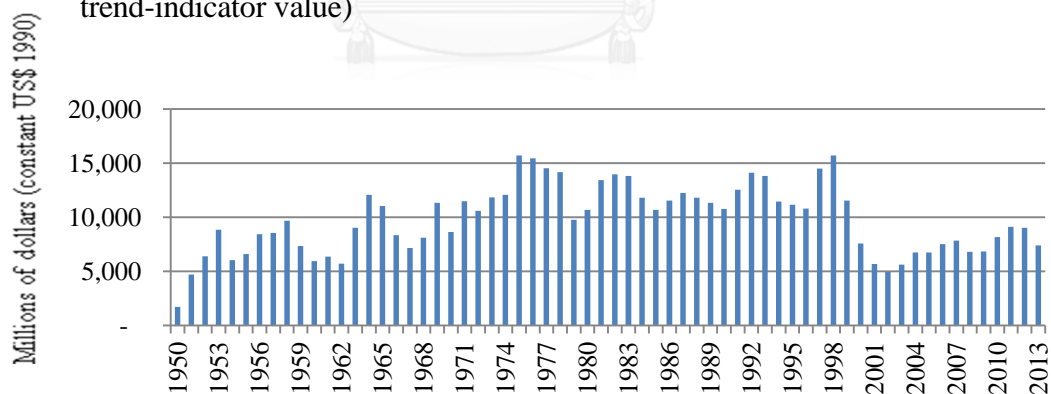
descriptive analysis method. A panel logistic model is obtained to analyze the relationship between states of economies and the start of participation in major wars of the military superpower countries using data from 1960 to 2010.

#### 4.4 US arms transfers, arms export policy, and defense industry

##### 4.4.1 The United States' arms transfers

As previously stated, the United States has been the world largest arms exporting country. Since the collapse of the Soviet Union, the United States has dominated the global arms market. Similar to world arms transfers, US arms transfers have fluctuated over time (SIPRI, 1988; 1998; 2014a; (Grimmett 2011)). Figure 10 displays the US arms transfer volumes between 1950 and 2013. It should be noted that the volume of arms transfers is calculated by multiplying the quantities with trend indicator values, not the prices actually paid. The transfers cover both in kind and money volume.

Figure 10 US arms transfer volume, 1950 – 2013 (in constant 1990 US\$ million, SIPRI trend-indicator value)



Source: Stockholm International Peace Research Institute (2014b).

An increase in US arms transfers in the 1950s was due to an increase in the threat of war, the Cold War in particular. After that, in the 1960s, the involvement of the United States in the global arms market was limited because of several reasons. Its policies of containment and a commitment to stop communist aggression tied up most

of the arms production of the United States, consequently leaving little surplus of arms for export. The United States' military operation in the Vietnam War, for example, was a large sponge for arms from the US defense industry. Another reason is the need for armaments for Africa, Asia and the Middle East was provided for by colonial ties.

In the 1970s, US arms exports increased sharply. This was mainly because of the sale of arms to Iran, South Korea, and Israel and the developing world. Since Congress passed the War Power Act of 1973, the United States decreased sending US military manpower abroad. The result of this policy was the use of arms sales to conduct US foreign policy. In addition, the Middle East countries benefited from the price rises because of the Yom Kippur war, and were eager to expand their demand for arms. In addition, several wars against communism and guerrilla bands fighting against governments started in the 1970s. Consequently, arms sales to the developing world accelerated. Examples of the underlying wars were Angola, Ethiopia, and the Lebanese civil war.

In the 1980s, the Reagan Doctrine allowed for a more assertive foreign policy. It allowed for a massive conventional and strategic arms buildup, and a willingness to use force as a key foreign policy tool. This policy stimulated the defense industry in the United States. During that time, aerospace companies in Europe were competing for a slice of the fighter markets, encouraging the United States' strength in the high technology field. As a result, several types of US aircraft were sold to Europe. In the Middle East, the United States provided billions of dollars in the form of Military Assistance Loans to Israel, for the purchase of US arms. In addition, it supplied Iraq in its war with Iran. From 1980 to 1986, Iran imported few arms from the United States. It has not imported conventional arms from the United States since 1987.

In the 1990s, US arms exports decreased. The end of the cold war led to a drastically changed security agenda. Both the Soviet Union and the United States disengaged from some of their conflicts. They took the opportunity to scale down military commitments. In addition, the severe competition with Russia affected the United States' arms markets. In the late 1990s, the US arms exports began to decline partly due to a sharp increase in domestic demand for arms in the United States (Brzoska

2004). Since the Pentagon was demanding levels of technology that only few other foreign recipients were interested in, the US arms markets decreased. During that period, the Middle East and newly industrialized countries were the two most important markets of the United States.

In the 2000s, US arms exports, as well as worldwide weapon orders, decreased due to the effects of the financial crisis in Asian countries in the late 1990s, and the global recession. During that period, new arms were difficult to conclude. Developing countries had limited budgets for arms procurement. However, some countries in the Middle East and Asia resumed or continued new weapons procurement programs. The increases in the price of oil provided an advantage for oil rich countries in funding arms procurement. However, such oil price increases also caused economic difficulties for many oil consuming countries.

Although the United States has faced ongoing competition from other suppliers, it has held its position in developing countries, especially with those able to afford new weapons. Since the beginning of the Cold War period, the United States has developed a large base of arms equipment clients globally with whom it is able to conclude a continuing series of arms agreements annually (Grimmett 2011). Consequently, there has been a stream of orders from year to year. It is logical that not only upgrades, spare parts, ordnance and support services are provided for the variety of weapons systems it has sold to these clients, the United States is also a supplier of new military equipment to these customers.

The list of US arms recipients between 1950 and 2013 is shown in Table 17. From 2000 to 2013, Asia and the Middle East were the most important US arms recipients. Europe also imported a large number of arms from the United States. The key Asian customers were industrialized countries, including South Korea, Australia, Japan, Singapore, and Taiwan. It can be seen that South Korea's arms imports from the United States between 2000 and 2013 were two times that of Japan from the same source.

Table 17 Trend Indicator Values (TIVs) of arms exports from USA, 1950-2013

(Unit: US\$ m. at constant 1990 prices)

No.	Region/ Recipient Country	Year								Total
		1950-1959	1960-1969	1970-1979	1980-1989	1990-1999	2000-2009	2010-2013	2000-2013	
<b>Europe</b>										
1	Germany (FRG)	6,059	16,255	11,792	2,785	3,849	999	389	1,388	42,127
2	United Kingdom	4,442	6,661	1,225	3,521	5,270	4,188	1,297	5,485	26,602
3	Italy	4,950	4,615	6,331	1,698	1,181	1,614	484	2,098	20,868
4	Greece	2,320	2,519	4,103	1,719	5,598	4,313	174	4,487	20,746
5	Netherlands	2,753	3,305	2,739	6,473	1,626	1,062	325	1,387	18,279
6	Spain	1,175	1,403	4,065	5,007	2,595	998	203	1,201	15,442
7	France	7,916	2,291	1,100	292	1,502	256	166	422	13,521
8	Belgium	3,114	2,032	953	3,449	561	137	9	146	10,256
9	Norway	1,621	2,159	195	2,304	481	529	260	789	7,549
10	Denmark	1,282	1,239	465	1,882	328	360	64	424	5,620
11	Switzerland	3	351	778	1,318	1,919	34	47	81	4,446
12	Portugal	871	331	253	665	732	417	207	624	3,473
13	Sweden	62	419	732	815	520	328	351	679	3,224
14	Yugoslavia	2,678	232	6	83					2,999
15	Finland	3		9	24	2,249	489	72	561	2,846
16	Poland					2	2,061	73	2,134	2,134
17	Austria	157	11	313	204	70	65		65	817
18	Romania					99	77	109	186	285
19	Czech Republic						148	7	155	155
20	Bosnia-Herzegovina					87				87
21	Hungary						59	24	83	82
22	Croatia					7	60		60	67
23	Slovenia					62	0		0	63
24	Latvia						24	15	39	39
25	Kazakhstan						31	3	34	34
26	Ireland			6	14	4	7		7	29
27	Lithuania						26	0	26	27
28	Estonia					4	13		13	17
29	Bulgaria					4	8	3	11	16
30	Malta							16	16	15
31	Cyprus					13				13
32	Georgia						12		12	12
33	Macedonia (FYROM)					6	5		5	12
34	Luxembourg			1	1	4	1		1	7
35	Albania				3					3
36	Serbia							0	0	0
<b>Subtotal-Europe</b>		<b>39,406</b>	<b>43,823</b>	<b>35,066</b>	<b>32,257</b>	<b>28,773</b>	<b>18,321</b>	<b>4,298</b>	<b>22,619</b>	<b>201,912</b>
<b>Asia &amp; Oceania</b>										
37	Japan	4,667	6,501	8,802	16,532	16,015	4,455	1,169	5,624	58,140
38	South Korea	2,584	3,063	5,374	8,129	10,393	7,665	3,732	11,397	40,941
39	Taiwan (ROC)	4,048	3,469	4,797	4,410	12,109	2,800	1,182	3,982	32,811
40	Australia	669	2,222	2,965	4,835	1,852	2,638	3,217	5,855	18,395
41	Singapore		6	1,026	1,772	1,661	2,573	2,356	4,929	9,390
42	Pakistan	1,112	509	423	2,533	542	1,077	1,690	2,767	7,888
43	Thailand	412	919	1,387	1,681	1,937	373	128	501	6,833
44	South Vietnam	94	1,862	4,666						6,622
45	Indonesia	86	401	502	884	276	70	120	190	2,337
46	Philippines	212	381	947	287	205	75	121	196	2,227
47	India	316	200	2	45	48	182	1,378	1,560	2,170
48	Malaysia		61	623	391	610	90	14	104	1,790
49	Afghanistan						399	1,335	1,734	1,735
50	New Zealand		316	189	87	144	144		144	881
51	Cambodia	16	31	279						326
52	Myanmar	20	123	103	20					265
53	Bangladesh			22	37	53	61	56	117	229
54	China				171	39				209
55	Sri Lanka		2	5	83	59	39	10	49	197
56	Laos	13	82	87						181
57	Brunei		2	29	52	30	0	15	15	127
58	Mujahedin (Afghanistan)*				66					67
59	North Korea				62					62
60	Fiji			12						12
61	Indonesia rebels*	6								6
62	Micronesia				2	2				5
63	Papua New Guinea				2	4				5
64	Palau					2				2
65	Nepal				1					1
66	Tonga					0				0
<b>Subtotal-Asia &amp; Oceania</b>		<b>14,255</b>	<b>20,150</b>	<b>32,240</b>	<b>42,082</b>	<b>45,981</b>	<b>22,641</b>	<b>16,523</b>	<b>39,164</b>	<b>193,854</b>



Table 17 Trend Indicator Values (TIVs) of arms exports from USA, 1950-2013 (Continued)

(Unit: US\$ m. at constant 1990 prices)

No.	Region/ Recipient Country	Year								Total
		1950-1959	1960-1969	1970-1979	1980-1989	1990-1999	2000-2009	2010-2013	2000-2013	
	<b>Middle East</b>									
67	Israel	37	2,296	12,302	7,639	6,526	5,343	194	5,537	34,334
68	Turkey	3,513	4,202	5,040	3,084	11,993	1,822	1,774	3,596	31,424
69	Saudi Arabia	126	575	3,411	9,243	13,025	1,500	1,247	2,747	29,124
70	Iran	583	3,214	21,099	64					24,961
71	Egypt	24		498	7,314	9,313	4,725	1,045	5,770	22,919
72	UAE			82	487	540	4,264	3,019	7,283	8,391
73	Kuwait			735	337	3,334	311	142	453	4,859
74	Jordan	1	307	2,207	1,291	445	394	115	509	4,758
75	Iraq	29			200		834	1,382	2,216	2,446
76	Bahrain			1	336	773	453	134	587	1,693
77	Oman		2	35	176	112	544	75	619	943
78	Qatar					1	280	430	710	712
79	Lebanon	43	26	14	190	107	21	63	84	462
80	North Yemen	4		423						428
81	Yemen						8	16	24	24
82	Syria	11								11
83	Azerbaijan							4	4	3
	<b>Subtotal-Middle East</b>	<b>4,371</b>	<b>10,622</b>	<b>45,847</b>	<b>30,361</b>	<b>46,169</b>	<b>20,499</b>	<b>9,640</b>	<b>30,139</b>	<b>167,492</b>
	<b>Africa</b>									
84	Morocco		294	812	884	458	27	920	947	3,393
85	Algeria		2	22	583	38	156	22	178	823
86	Tunisia		39	98	439	102	89	52	141	818
87	Ethiopia	41	200	305		37				582
88	South Africa	176	198	54	13	27	64	38	102	569
89	Nigeria		0	185	148	18	16	54	70	422
90	DR Congo		144	194	18		28		28	384
91	Sudan		7	168	191					367
92	Libya	0	114	227						341
93	Kenya		1	148	115	8		0	0	272
94	Gabon		3	94	37	2		1	1	136
95	Cameroon		1	57	50	3		12	12	122
96	Somalia				106			1	1	107
97	Chad				102		1		1	103
98	Botswana			0	33	29	17	2	19	81
99	Niger		0	56				2	2	58
100	Uganda		3	20	14			0	0	37
101	Ghana		2	8	3		10	4	14	28
102	Liberia	1	20	4	2					28
103	UNITA (Angola)*				26					26
104	Mauritania				15	5				20
105	Mali		2		0	14				16
106	Angola				5	7		1	1	13
107	Guyana		0	13						13
108	Central African Republic						9		9	9
109	Malawi					9				9
110	Equatorial Guinea						3	5	8	8
111	Namibia					3		5	5	8
112	Tanzania			6	3					7
113	Togo				1	6				7
114	Cote d'Ivoire			5		0				5
115	Lesotho				0	5				5
116	Biafra		4							4
117	Djibouti					1		3	3	4
118	Seychelles				2	0		1	1	3
119	Senegal		0					2	2	2
120	Congo							1	1	1
121	Sierra Leone			1						1
122	Zimbabwe		1			0				1
123	Benin			0						0
124	Burkina Faso		0							0
125	Guinea		0							0
126	Madagascar			0						0
127	Mauritius		0							0
128	Rwanda		0							0
	<b>Subtotal-Africa</b>	<b>218</b>	<b>1,035</b>	<b>2,477</b>	<b>2,790</b>	<b>772</b>	<b>420</b>	<b>1,126</b>	<b>1,546</b>	<b>8,833</b>

Table 17 Trend Indicator Values (TIVs) of arms exports from USA, 1950-2013 (Continued)

(Unit: US\$ m. at constant 1990 prices)

No.	Region/ Recipient Country	Year								Total
		1950-1959	1960-1969	1970-1979	1980-1989	1990-1999	2000-2009	2010-2013	2000-2013	
	<b>America</b>									
129	Canada	6,922	6,073	1,924	5,381	2,048	1,434	855	2,289	24,631
130	Brazil	714	997	1,743	562	283	325	288	613	4,912
131	Argentina	713	633	1,558	179	560	164	116	280	3,922
132	Colombia	139	312	161	360	477	879	316	1,195	2,641
133	Mexico	32	245	408	585	621	516	222	738	2,630
134	Chile	405	347	731	90	211	422	228	650	2,431
135	Peru	393	280	665	400	75	133	17	150	1,959
136	Venezuela	276	123	652	779	98	31		31	1,958
137	Ecuador	30	124	204	245	121	5	10	15	739
138	Uruguay	163	52	106	51	50				425
139	Bolivia	37	43	68	137	52	18	3	21	356
140	Honduras	34	19	58	230		0	0	0	342
141	El Salvador	19	30	54	163	38	29	2	31	330
142	Dominican Republic	53	59	24	72	10	48		48	269
143	Guatemala	22	55	92	64	24				257
144	Panama		3	74	20	8	5	15	20	125
145	Nicaragua	28	26	35						90
146	Cuba	68								68
147	Jamaica		1	30	12	15	5	1	6	63
148	Paraguay	7	25	5	2			2	2	44
149	Trinidad and Tobago		0		7		13	24	37	44
150	Bahamas				1	5	34		34	40
151	Haiti	13	9	17	1					39
152	Contras (Nicaragua)*				27					28
153	Costa Rica	3	1	11	6			1	1	21
154	Armas (Guatemala)*	8								8
155	Haiti rebels*		7							7
156	Saint Kitts and Nevis				6					6
157	Saint Vincent				4					4
158	Suriname					3				3
159	Anti-Castro rebels (Cuba)*		2							2
160	Marshall Islands				2					2
161	Barbados				1					1
162	Belize					0				0
	<b>Subtotal-America</b>	<b>10,079</b>	<b>9,466</b>	<b>8,620</b>	<b>9,387</b>	<b>4,699</b>	<b>4,061</b>	<b>2,100</b>	<b>6,161</b>	<b>48,397</b>
	<b>Others</b>									
163	NATO**				4,500		420		420	4,920
164	United Nations**		13			6				19
165	Regional Security System**					15				15
166	Unknown country		72	8		49		3	3	130
	<b>Subtotal-Others</b>		<b>85</b>	<b>8</b>	<b>4,500</b>	<b>70</b>	<b>420</b>	<b>3</b>	<b>423</b>	<b>5,084</b>
	<b>Total</b>	<b>68,322</b>	<b>85,171</b>	<b>124,245</b>	<b>121,361</b>	<b>126,439</b>	<b>66,347</b>	<b>33,682</b>	<b>100,059</b>	<b>625,572</b>

Remark: A '0' indicates that the value of deliveries is less than US\$0.5m. \* indicates a group of people. \*\* indicates an alliance or a group of countries.

Source: Stockholm International Peace Research Institute (2014d).

In Europe, from 2000 to 2013 the United Kingdom, Greece, Poland, Italy, Germany, the Netherlands and Spain were the largest US arms recipients. The import

volume of these countries accounted for 80.37% of the total US arms sales to Europe in this period. In addition, Canada and Columbia were the two largest US arms importers in the Americas. The arms transfers to Canada were more than 50% of the total US arms transfers to the Americas. Few arms from the United States were exported to the Africa region.

In the Middle East, the most significant US arms recipient countries were the UAE, Egypt, Israel, Turkey, Saudi Arabia and Iraq. Between 2000 and 2013, the United States transferred arms to the following GCC countries; Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the UAE, 41.14% of the total US arms transfer to the Middle East. The US arms transfers to the GCC countries in that period, 2000-2013, were 2.24 times the value of arms transfers to Israel.

#### **4.4.2 The United States' arms export policies**

Besides the economic situations in the US arms recipient countries, the fluctuation of the United States' arms exports is mainly due to US foreign policy. It is said that the United States uses arms sales to reward countries willing to support its policies. The policies have changed overtime from anti-communism to democracy building to anti-terrorism (Stohl, 2008).

Before the 9/11 situation in 2001, the United States announced a well-known foreign policy “promoting democracy and human rights in developing countries”. The United States vowed to use the arms trade as an instrument to promote democracy and human rights in developing countries. However, there is no distinct evidence to prove that the United States has controlled the purpose of arms usage in the arms recipient countries (Blanton 2000); (Perkins and Neumayer 2010); (Rich n.d.). After all, the United States, led by President George W. Bush, announced a new foreign policy under the concept of “the Global War on Terror” that started after the 9/11 terrorism in 2001. Since that time, the United States has exported arms to all recipients who declared themselves against terrorism regardless of their respect for human rights, democratic principles, or nonproliferation (Stohl, 2008).

According to Stohl (2008), President Bill Clinton set the United States' policy of arms exports in 1995. This law guided the decisions of the United States' arms exports and established foreign policy goals for US conventional arms transfers. The goals were to (1) ensure that US military forces enjoyed technological advantages over potential adversaries, (2) help allies and friends to defend against aggression, while promoting interoperability with US forces when combined operations were required, to promote regional stability in areas critical to US interest, while preventing the proliferation of weapons of mass destruction and their missile delivery systems, (3) promote peaceful conflict resolution and arms controls, human rights, democratization, and other foreign policy objectives, and (4) enhance the ability of the US defense industrial base to meet US defense requirements and maintain long-term military technological superiority at low cost.

Besides foreign policy goals, the United States' arms exports must be consistent with three crucial laws. The first crucial law is the 1979 Arms Export Control Act (AECA). This statute indicated the purposes for which arms may be transferred; internal security, self-defense, and US operations. The statute required a process by which Congress had to be given advance notice of major arms sales. The statute also required quarterly and annual reports on overseas sales activity. The reports are provided by the Departments of Defense and State to Congress.

The second important law is the 1961 Foreign Assistance Act. This act guided the provision of economic and military assistance to foreign governments. For instance, this law required that the arms exports neither undermine long-term security nor weaken the democratic movement.

The third essential law is the 1970 Export Administration Act. This act controlled shipments of dual-use goods, technology and information for both military and civilian uses. It lapsed in 1994 but has been retained under the emergency powers of the president. It contained the Commerce Control List, which includes certain ballistic missile production technologies, dual-use chemicals, shotguns, as well as police equipment.

The three laws govern US arms sales and military assistance programs. Among a number of US arms sales programs, the two largest programs are Foreign Military Sales (FMS) and Direct Commercial Sales (DCS). FMS is government-to-government sales negotiated by the Pentagon, in which the weapons come from existing Pentagon stocks or from new production, whereas DCS is arms sales concluded between US weapons manufacturers and foreign clients, and is controlled by the State Department.

Besides arms sales, the United States undertakes many US military assistance programs. The three largest military assistance programs are Excess Defense Articles (EDA), Foreign Military Financing (FMF), and International Military Education and Training (IMET). EDA is the program in which surplus or obsolete US weapons are given away free or at a dramatically reduced cost to foreign governments. FMF is the program that is granted to foreign governments for procuring weapons, training, and other defense articles and services from the United States. Finally, IMET is the program that allows foreign governments and militaries to participate in any of more than 2,000 courses in US military management and technical training programs.

#### **4.4.3 Defense industry in the United States**

The defense industry or the military industrial complex is an important industry in the United States. It is embodied in the economy and society of the United States. Though pressure is brought to reduce US military expenditure, the US defense industry has its own ways of surviving and minimizing attempts to reduce its size and influence (Marsella, 2011; Stander, 2014).

The US defense industry has used many strategies for survival, for example, merging and strengthening arms industries, the development and sale of new weapons to the US government and abroad, participating in civilian projects, privatizing in many areas previously served by the US government, lobbying in Washington, and ensuring a revolving door for key personnel to move from industry to political positions. The US defense industry has a close relationship with Congress. This fact is manifested in the connections between many top executives, such as Edward C. Pete Aldridge Jr., Michael W. Wynne, Richard Lee

Armitage, Colin Powell, Brent Scowcroft, Philip Odeen, Paul Wolfowitz and Dick Cheney, with the US defense industry (Stander, 2014). It demonstrates how the US defense industry influences the US military and foreign policies.

There is also a vital link between the US defense industry and the defense industries outside the United States. The United States has an agreement to stockpile weapons in Israel for future needs (Stander, 2014). It has helped Israel to enlarge its capacity to manufacture and export arms. It is said that Israel's defense industry is an extension of the US defense industry. The main purpose of the support of the United States for Israel is to safeguard the interests of the United States in the Middle East. With advanced defense industry, Israel exports arms, as well as know-how, to its recipients around the world (Table 24). It does business with more than 80 countries. Thailand is also on Israel's list of arms recipients. The most worrisome point is that, while other countries exporting arms have rules, there are no principles set down by Israel to control its arms sales (Stander, 2014).

Besides Israel's defense industry, the United States also has close relationship with the United Kingdom's defense industry. It has contracts with BAE Systems, which was a direct descendant of many of Britain's key arms manufacturers (Stander, 2014).

In the United States, the US defense industry not only does business in just arms and armaments, but goes into every part of the economy. It provides orders for food, clothes and footwear, catering, electronics, cinema, film making, construction, etc. (Turse, 2008). But among the most sinister and damaging developments has been the bringing into being of private military companies which provide security and prison services formerly provided by the military and subject to military law. These companies have grown in both number and in size (Johnson, 2004; Worrell, 2011).

As previously stated, the defense industry plays an important role in the United States. Nonetheless, former President Dwight David Eisenhower warned against the growing dangers of the defense industry. He stated that the councils of the US government must guard against influence by the defense industry (Marsella, 2011).

Before that, C. Wright Mills, a social scientist, warned in 1956 of the dangers of the rise of the military in the United States (Stander, 2014). However, the defense industry is now beyond the United States' governmental control. It is both large and powerful. It guides and supports US foreign policies and actions for its interests or profits. Many corporations in the defense industry have made billions of dollars from wars ((Pilisuk and Rountree 2008); SIPRI, 2008; Marsella, 2011; Junmian, 2012). Table 18 shows the list of the 10 largest defense corporations in 2006. Four of them were in the United States.

Table 18 10 largest defense corporations in 2006

(Unit: US\$ million)			
Ranking	Producers' name	Country	Arms Sales
1	Boeing	USA	30,690
2	Lockheed Martin	USA	28,120
3	BAE Systems	UK	24,060
4	Northrop Grumman	USA	23,060
5	Raytheon	USA	19,530
6	General Dynamics	USA	18,770
7	EADS	West Europe	12,600
8	L-3 Communications	USA	9,980
9	Finmeccanica	Italy	8,990
10	Thales	France	8,240

Note: An arms sale, here, means only arms sales, excludes sales of other militarily goods and services.

Source: SIPRI (Stockholm International Peace Research Institute) Yearbook 2008

Furthermore, according to Junmian (2012), 44 US defense corporations dominated the top 100 defense corporations in 2010. These corporations accounted for more than 60% of total arms sales whereas 30 corporations from Western Europe had 29% of the total arms sales. Table 19 shows the list of the 30 largest defense corporations located in countries around the world in 2010. Of these, 18 corporations are from the United States.

Table 19 30 largest defense corporations in 2010

Ranking	Producer	Country	Products	Arms sales (US\$m.)	Total sales (US\$m.)	Total profit (US\$m.)	Total employment (persons)
1	Lockheed Martin	USA	Aircraft, Electronics, Missiles, Space	35,730	45,803	2,926	132,000
2	BAE Systems	UK	Aircraft, Artillery, Electronics, Missiles, Military vehicles, Small arms/ammunition, Ships	32,880	34,609	1,671	98,200
3	Boeing	USA	Aircraft, Electronics, Missiles, Space	31,360	64,306	3,307	160,500
4	Northrop Grumman	USA	Aircraft, Electronics, Missiles, Ships, Space	28,150	34,757	2,053	117,100
5	General Dynamics	USA	Artillery, Electronics, Military vehicles, Small arms/ammunition, Ships	23,940	32,466	2,624	90,000
6	Raytheon	USA	Electronics, Missiles	22,980	25,183	1,879	72,400
7	EADS	Trans-European	Aircraft, Electronics, Missiles, Space	16,360	60,599	732	121,690
8	Finmeccanica	Italy	Aircraft, Artillery, Electronics, Missiles, Military vehicles, Small arms/ammunition	14,410	24,762	738	75,200
9	L-3 Communications	USA	Electronics, Services	13,070	15,680	955	63,000
10	United Technologies	USA	Aircraft, Electronics, Engines	11,410	54,326	4,711	208,220
11	Thales	France	Artillery, Electronics, Missiles, Military vehicles, Small arms/ammunition, Ships	9,950	17,384	60	63,730



Table 19.30 largest defense corporations in 2010 (Continued)

Ranking	Producer	Country	Products	Arms sales (US\$m)	Total sales (US\$m)	Total profit (US\$m)	Total employment (persons)
12	SAIC	USA	Services, Components (Military vehicles)	8,230	11,117	618	43,400
13	Oshkosh Truck	USA	Military vehicles	7,080	9,842	790	12,400
14	Computer Sciences Corp.	USA	Services	5,940	16,042	759	91,000
15	Honeywell	USA	Electronics	5,400	33,370	2,022	130,000
16	Safran	France	Electronics	4,800	14,252	673	54,260
17	Rolls-Royce	UK	Engines	4,330	16,794	839	38,900
18	General Electric	USA	Engines	4,300	150,211	11,644	287,000
19	ITT Corp.	USA	Electronics	4,000	10,995	654	40,000
20	Almaz-Antei	Russia	Missiles	3,950	4,436	24	88,700
21	United Aircraft Corp.	Russia	Aircraft	3,440	4,222	-639	95,900
22	DCNS	France	Ships	3,320	3,315	181	12,500
23	KBR	USA	Services	3,310	10,099	327	35,000
24	URS Corp.	USA	Electronics	3,030	9,177	288	47,000
25	Mitsubishi Heavy Industries	Japan	Aircraft, Missiles, Military vehicles, Ships	2,960	33,080	343	68,820
26	Alliant Techsystems	USA	Small arms/ammunition	2,870	4,842	313	15,000
27	Rockwell Collins	USA	Electronics	2,860	4,665	561	20,000
28	Saab	Sweden	Aircraft, Electronics, Missiles	2,780	3,390	63	12,540
29	Babcock International Group	UK	Services, Ships, Other	2,770	4,475	162	27,340
30	Textron	USA	Aircraft, Electronics, Engines, Military vehicles	2,740	10,525	86	32,000

Note: Arms sales, here, includes arms sales and sales of other militarily goods and services.

Source: Junmian (2012).

It can be seen that in 2010, 18 US defense corporations employed 1,717,710 people. Furthermore, the United States Census Bureau (n.d.) reported that the US household size in 2010 was 2.59 persons, and there were 309,347,057 Americans (World Bank 2015b). These figures imply that 4,448,869 American people, approximately 1.44% of the US population, were associated with the US defense industry. This shows how big and how important the US defense industry is.

In parallel to exporting arms, the United States has intervened in many armed conflicts in different regions.

#### **4.5 The United States' military intervention in foreign countries**

##### **4.5.1 The motivations for the United States to engage with wars in foreign countries**

The United States meets all qualifications to be a global empire seeking hegemonic economic, political and cultural control of the world (Marsella 2011). This statement is supported by a world-wide system of military bases, a vast and strong defense industry, and the extensive national security system of the United States.

The United States involves wars across the globe in various roles. It has been one of five permanent members of the United Nations Security Council and a superpower active member of the United Nations. It is also a member of NATO. It portrays itself as a global policeman (Stander, 2014). It sometimes helps to hold dialog to seek solution to conflicts, for example, the United States involvement in the Israeli-Palestinian Conflict (Abo-Sak 1997). Furthermore, it invades foreign countries in different parts the world. However, evidence shows that the United States intervenes in only some armed conflicts, ut not all of them. This leads to the question “what are the differences between armed conflicts in which the US has intervened, and the armed conflicts it has not intervened in? The answer is that the United States has spent enormous budgets on military intervention in natural resource rich countries, especially crude oil rich countries in the Middle East, while spending less money on military intervention in other countries.

Many people argue that the United States uses its military power, combined with its high-tech arms sales, via its foreign policies, to promote or protect its own interests rather than calling for global peace and harmony or promoting human rights, or democracy, as it has vowed (Stander, 2014). Although the United States announced a foreign policy to protect the rights and freedoms of citizens in all countries, it has exported arms without caring about human rights abuses or autocratic actions in arms recipient countries (Blanton, 2000; Parkins and Neumayer, 2010). Rather, it seems that the United States, as well as other arms exporting countries, has exported arms to countries out of its economic and security interests (Perkins and Neumayer, 2010; SIPRI; 2014b). It is possible that the United States gains economic benefits from wars in those countries by establishing overseas bases and infrastructure, as well as the interoperability, necessary for US intervention beyond maintaining regional stability. Perhaps, it preserves the US defense industry.

After the end of World War II, the world entered the Cold War period (1945-1991). It was a continuing state of political and military tension between two groups with economic and political differences. The first group, the Western world, was led by the United States and its allies, whereas the other group, the communist world, was led by the Soviet Union and its allies. During that period, the communist world was provided for by the Soviet Union. The Soviet Union exported a lot of armaments to the communist world. At the same time, the United States supported the Western world. The Cold War was supposed to end when the Soviet Union collapsed in 1991. Since then, the United States has been the lone superpower in the world. Despite the Cold War ending, the United States has still exported a lot of conventional weapons to countries around the world and continues to undertake military intervention in many countries.

US involvement in wars in foreign countries follows its foreign policy, which is claimed to be influenced by the US defense industry (Marsella, 2011). The United States announced and changed its foreign policy to respond to its situations. During the Cold War period, the United States provided both economic and military needs to its allies and friends. As the Cold War ended, the United States decreased its support to those allies and

friends. America's foreign policy, including its arms export policy, changed. It announced the use of arms exports as a tool to promote democracy and human rights in developing countries. Then, after the 9/11 bombing, the policy of war against terrorism was announced. Consequently, the spread of US arms exports was affected by these policies.

It is argued that despite the US government announcing foreign political, economic, and military policies to spread democracy, defend freedom or human rights, and fight the global war on terror, the military intervention of the United States has been driven by a desire for economic benefits, such as commercial exploitation. The desire might be possible by using military power, which is supported by the integration of the enormous US worldwide military presence. As mentioned before, the United States runs more than 700 military bases in foreign countries. There many plausible reasons or motives for the US engagement in war in foreign countries (Marsella, 2011). These reasons include the following:

(1) National defence which responds to attacks on the homeland of the United States, such as the 9/11 bombing

(2) Preventing and stopping the completion of political, ideological and economic alternatives, such as the Cold War, the Cuba War, and the Vietnam War

(3) Protection of natural/economic resources useful to the US, such as the Persian Gulf War, the Iraq War, and the Suez Canal Crisis

(4) Expansion of US territory, such as Hawaii Annexation and the Philippines invasion

(5) Obligations of military alliances and pacts, such as the Korean War

(6) Obligations of UN resolutions, such as the Iraq War, Iran Sanctions

(7) Defense from criminal syndicates, such as the war on drugs in Columbia

(8) Rescue of American citizens, such as Grenada

(9) Liberation from US opposed oppressive governments, such as World War II, the Iraq War, the Afghanistan War

(10) Protection of commercial interests and US national interests, such as conflicts in Central America and South America

(11) Decisions by US authoritarian leaders, such as Bush-Cheney-Rumsfeld in Iraq

The United States had intervened in many wars because of these reasons. It is still showing no sign of reluctance to engage in war. Table 20 shows a list of US intervened wars or armed conflicts around the world between 1946 and 2010.

#### **4.5.2 The frequency of US military intervention in foreign countries**

From Table 20, it can be seen that 120 countries were involved armed conflicts between 1946 and 2010. Of these, the United States conducted military intervention in 53 countries. While undertaking military intervention in 10 of 12 armed conflicts in the Middle East, 16 of 24 armed conflicts in the Americas, 11 of 24 armed conflicts in Asia, and 9 of 20 armed conflicts in Europe, the United States took part in only 7 of 40 armed conflicts in Africa. Furthermore, it is evident that the United States took part in military intervention in foreign countries almost every year. Only in 1955 and 1957 is there no evidence of US military intervention in foreign countries. The following paragraphs provide some information on US military intervention.

Starting in 1946, the United States deployed its military resources in Yugoslavia, Iran, China, South Korea, and the Philippines. From 1950 to 1953 it deployed its military resources in Korea. After North Korean cities were attacked by bombers, the United States threatened to use nuclear weapons. During the Middle East crisis of 1958, the United States deployed marines to quell a rebellion in Lebanon and later threatened to attack Iraq with

Table 20 List of US interventions in armed conflicts, 1946-2010

Item	Region	Country	Year
1	Europe	* Albania	1946
2		Azerbaijan	1993
3		* Bosnia-Herzegovina	1995
4		* Croatia	1995
5		Cyprus	1964
6		France	1954
7		* Germany (and West Germany)	1948
8		Georgia	1993
9		* Greece	1946
10		Hungary	1956
11		* Italy	1948
12		* Macedonia	1993
13		Moldova	1992
14		Netherlands	1948
15		Portugal	1962
16		Rumania	1956
17		Russia (Soviet Union)	1945
18		* Serbia (Yugoslavia)	1999
19		Spain	1946
20	Middle East	* United Kingdom	1948
21		* Egypt	1956
22		* Iran	1979
23		* Iraq	1990
24		Israel	1948
25		Jordan	1948
26		* Kuwait	1990
27		* Lebanon	1982
28		* Oman	1965
29		* Saudi Arabia	1990
30		* Syria	1965
31		Turkey	1948
32		* Yemen	1962
33	Asia	* Afghanistan	1979
34		Australia	1962
35		Bangladesh	1971
36		Brunei	1963
37		* Cambodia	1970
38		* China	1949
39		India	1947
40		* Indonesia	1965
41		* Laos	1964
42		Malaysia	1963
43		Myanmar	1948
44		Nepal	1948
45		* North Korea	1950
46		* Pakistan	1947
47		Pania New Guinea	1946
48		* Philippines	1946
49		* South Korea	1950
50		Sri Lanka	1948
51		* Taiwan	1946
52		Tajikistan	1992
53		Thailand	1946
54		Tibet	1949
55		Uzbekistan	1992
56		* Vietnam	1954

Table 20 List of US intervention in armed conflicts, 1946-2010(Continued)

Item	Region	Country	Year
57	Africa	Algeria	1946-1947
58		* Angola	1975-1976
59		Burkina Faso	1985-1986
60		Burundi	1993-1994
61		Cameroon	1983-1984
62		Central African Republic	1966-1967
63		Chad	1963-1964
64		Comoros	1964-1965
65		* Congo	1960-1961
66		Cote d'Ivoire	1982-1983
67		Dibouti	1992-1993
68		Eritrea	1988-1989
69		Ethiopia	1976-1977
70		Gabon	1963-1964
71		Gambia	1963-1964
72		* Ghana	1966-1967
73		Guinea	1963-1964
74		Guinea-Bissau	1963-1964
75		Kenya	1963-1964
76		Lesotho	1981-1982
77		* Liberia	1949-1950
78		* Libya	1949-1950
79		Madagascar	1946-1947
80		Mali	1963-1964
81		Mauritania	1963-1964
82		Morocco	1963-1964
83		Mozambique	1963-1964
84		Niger	1963-1964
85		Nigeria	1963-1964
86		Rwanda	1993-1994
87		Senegal	1963-1964
88		Sierra Leone	1963-1964
89		* Somalia	1963-1964
90		South Africa	1963-1964
91		* Sudan	1963-1964
92		Tanzania	1963-1964
93		Togo	1963-1964
94		Tunisia	1963-1964
95		Uganda	1963-1964
96		Zimbabwe (Rhodesia)	1963-1964





nuclear weapons if it invaded Kuwait. This crisis helped the United States to set its foreign policy with Arab countries.

In the early 1960s, the United States undertook military operations in the Caribbean. It invaded Cuba at the Bay of Pigs in 1961 and invaded the Dominican Republic in 1965. During this period, the Central Intelligence Agency (CIA), harbored and trained Cuban exile groups in Miami. The trained group, then, launched terrorist acts against Cuba. The CIA also supported or installed pro-US leaders in many countries, such as Iran, Chile, Guatemala, and Indonesia during the Cold War.

Between 1960 and 1975, the United States engaged in war in South-east Asia. The US forces fought against North Vietnam. Meanwhile, Communist rebels were fighting to overthrow pro-US regimes in Cambodia, Laos, and South Vietnam.

During the 1980s, the United States backed the pro-US regime in El Salvador. It also supported right-wing exile forces that were fighting the leftist government in Nicaragua. Nicaraguan Contra rebels were trained by the CIA. They then launched terrorist acts against civilian clinics and schools and Nicaraguan harbors. In addition, in 1983, the United States invaded Grenada to drive out a new military regime.

In the Middle East, the US forces were deployed in 1980 after the Shi'ite Muslim revolution in Iran against Shah Pahlevi's pro-US dictatorship. US Marines were then deployed in a neutral peacekeeping operation after the 1982 Israeli occupation of Lebanon. However, it is said that the United States took the side of Lebanon's pro-Israel Christian government against Muslim rebels. Syria was also involved in the war in Lebanon. In 1986, the US launched a bombing raid on Libya. In the end, Libya's Arab nationalist leader Muammar Qaddafi remained in power. After that, the US Navy intervened in the war between Iran and Iraq between 1987 and 1988. It fought against Iran. As a result, it sank Iranian ships and shot down an Iranian civilian jetliner.

In 1989, the United States invaded Panama in order to oust the nationalist regime of Manuel Noriega. The US bombing raids on Panama City led to a conflagration in civilian villages.

In 1990, the United States deployed forces in the Persian Gulf after Iraq invaded Kuwait. The Kuwaiti monarchy and the Muslim monarchy in Saudi Arabia were supported by the United States to against the government of Iraq. In January 1991, Iraq was bombed by the United States and its allies.

In the 1990s, the United States intervened in Africa. It deployed troops in Somalia, which was torn by a civil war and economic sluggishness, in 1992. The United States bombed a Mogadishu neighborhood. This operation enraged crowds who killed 18 US soldiers.

The United States also intervened in the Balkan region of Europe. There was the breakup of the multi-ethnic federation of Yugoslavia in 1992. The United States waited until Serb forces killed Muslim civilians in Bosnia. It then bombed the country in 1995. After that, in 1999, the United States bombed Serbians to force President Slobodan Milosevic of Serbia to withdraw forces from Kosovo.

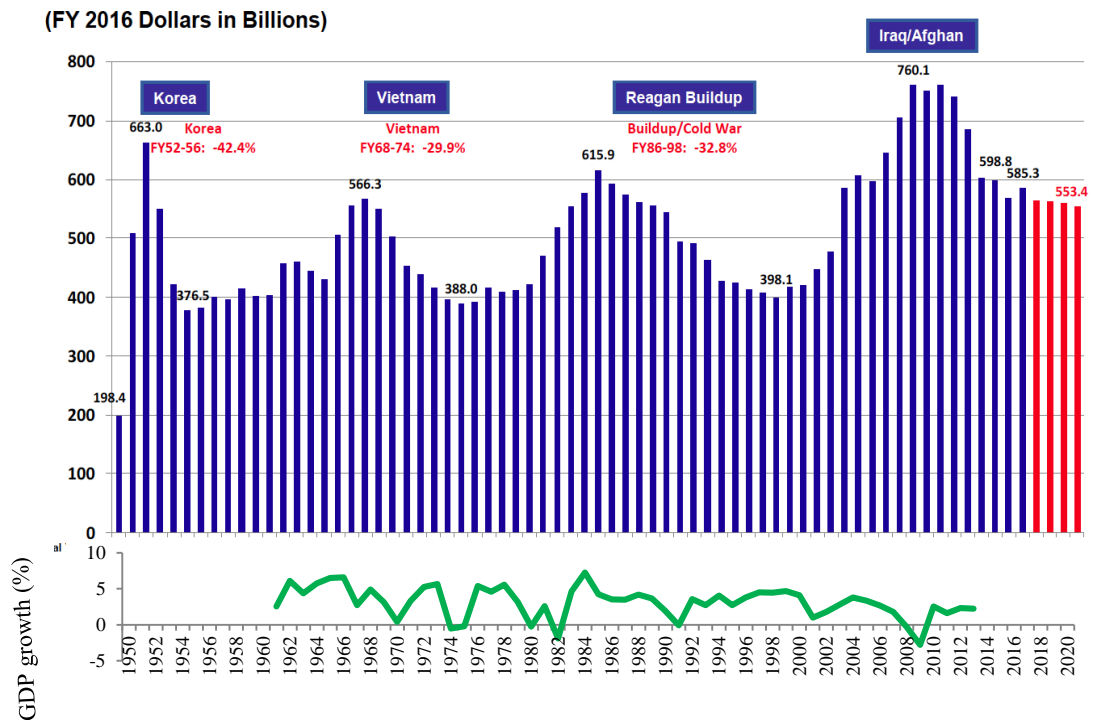
The United States made attacks against Osama Bin Laden after the 1998 bombings of two US embassies in East Africa. The United States said that Osama Bin Laden was not only responsible for the training camps in Afghanistan, but also a pharmaceutical plant in Sudan. The United States claimed that the plant was a chemical warfare installation. Bin Laden retaliated by attacking a US Navy ship docked in Yemen in 2000.

After the 9/11 in 2001, the United States forces and its allies bombed Afghanistan, and moved to Iraq while promoting anti-US terrorism.

Since 1950, the United States has spent a large amount of military expenditure to undertake military operations as well as other military activities. Figure 11 shows the level of

US military expenditure in fiscal year 2016 dollars. This military expenditure is used to procure a massive mix of air-sea-land power projection capabilities.

Figure 11 US Military expenditure from 1950-2020 in constant \$US fiscal year 2016 dollars



Remark: Red bars are the projections.

Source: Office of the Under Secretary of Defense (Comptroller/CFO), Fiscal Year 2016

Budget Request, Department of Defense, February 2015, p.26 cited by Cordesman and Peacock (2015); World Bank (2015a).

From Figure 11, it can be seen that there was an economic downturn in the United States in 1979. Consequently, a year later, the United States increased its military expenditure by undertaking the Reagan Buildup project. A similar situation emerged again in 2000. The United States faced economic sluggishness in 2000. After that, the Iraq/Afghanistan War started and American military expenditure increased.

As shown, the United States has engaged in many wars in foreign countries. It is found that from 1914 to 2010 the United States engaged in 7 major wars; World War I (1914-1918), World War II (1939-1945), the Korean War (1950-1953), the Vietnam War (1955-1975), the Gulf War (1990-1991), the Afghanistan War (2001), and the Iraq War (2003-2010). World War II resulted in the creation of the United Nations and NATO. After World War II ended, the world entered the Cold War, which led to proxy wars like the Korean War and the Vietnam War. After that, there were several wars in the Middle East. World War II built military relationships between the United States with its allies in NATO and its former adversaries Germany and Japan. While the wars or armed conflicts in the Middle East created a solid relationship between the United States and Israel, the relationship linked the United States to other wars. Indeed, the United States cannot undertake military operations abroad alone. Besides support from its defense industry, it needs supports from its allies, as well as the United Nations and NATO.

#### **4.6 The US relations with Israel, Germany, Japan, the United Nations, and the North Atlantic Treaty Organization**

The United States has a close military relationship with many countries, especially Israel, Germany, and Japan. The relationship between the United States and each of these countries is unique. US military intervention outside the United States has been, at least partially, supported by Israel and Japan. Without the support of Israel and Japan, the United States might not have been able to influence many armed conflicts. The close relationship with Israel and Japan links the United States and these countries to wars and natural resource exploitation. The United States also has a close relationship with Germany. Besides being a buffer state against Russia, and formerly the Soviet Union, Germany is a key partner in US relations with Europeans in NATO and the European Union. Some information regarding US military relations with Israel, Germany, and Japan are described in the following subparts. In addition, a brief description about the United Nations Security Council and the North Atlantic Treaty Organization (NATO) is provided.

#### **4.6.1 The relationship between the United States and Israel**

Israel and the United States have mutual interests (Mark, 2004; Kamrava, 2005; Palestine-Facts (2011); Zanotti, 2014). According to Mark (2004), the US presence in the Middle East is strengthened by the relationship between the United States and Israel. One of Israel's major duties is to destroy the potential disruption to the oil supply in the Middle East.

According to Abo-Sak (1997), in the 1930s there was the discovery of oil in Saudi Arabia and the creation of an activist Jewish community in Palestine. The United States became increasingly dependent on the Middle East's oil and it enjoyed strategic friendships with the Arab oil-producing countries, especially during the Cold War when Arabs sided with the United States against the Soviet Union and communism. Meanwhile, Israel also became stronger and the Arabs attributed this to the United States' involvement in supporting Israel.

After the Suez Crisis, in the 1950s, the United States accepted Israeli proposals for a long-term strategy. Their corporations have led them into a struggle against terrorists in the Middle East (Marsella, 2011). However, the corporations continue until today.

The rock-solid relationship between the United States and Israel is hostile to Arabs in Palestine. According to Palestine-Facts (2011), Israel-US relations have evolved from an initial US policy of supporting the creation of a Jewish homeland in 1948. In the United Nations, the United States cast its first veto on a Syrian-Lebanese complaint against Israel in 1972. While the United Nations had been hostile to Israel, the United States was Israel's sole defender in the world body. Israel has returned the companionship by voting with the United States on virtually all issues. Since then, Israel and the United States have developed an unusual friendship that does not depend on the parties in power either in the United States or Israel. This relationship makes a militarily powerful Israel that depends on the United States for its economic and

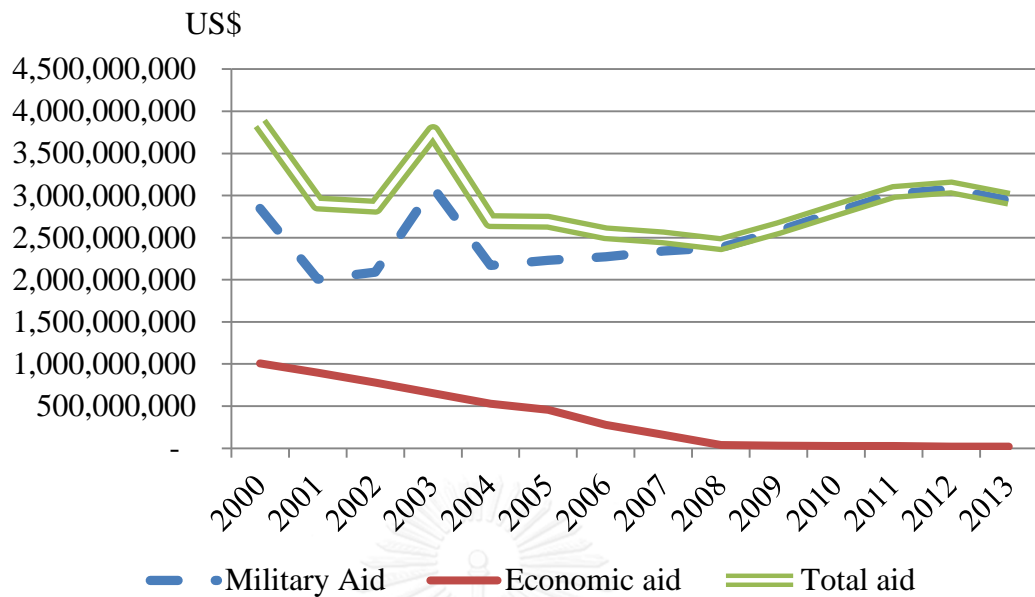
military strength. This relationship also helps the United States to balance competing interests in the Middle East.

As previously stated, Israel and the United States have mutual interests. It is believed that their mutual interests are only possible if the United States continues to stand behind Israel. According to Palestine Facts.org (n.d.), Israel and the United States have worked together. Israel helps to counter the threat to the US interests in the Middle East. These threats include the potential disruption to the Middle East's oil, the proliferation of weapons of mass destruction, and state-sponsored terrorism. They have extended cooperation to other programs such as sharing cutting-edge technology and valuable intelligence, researching and developing new weapons, establishing joint anti-terrorism strategies, conducting joint military exercises, and pre-positioning weapons in Israel for use in the event that the United States needs to respond immediately to a future conflict in the Middle East countries.

The significance of Israel to the United States can be seen from the action of Congress that has placed considerable importance on the maintenance of a close and supportive relationship (Zanotti 2014). Congress has monitored the aid issue closely along with other issues in bilateral relations. Israel's concerns have affected US policies. Since 1985, Israel has received approximately US\$3 billion in grants annually from the United States. In the past, Israel received significant economic assistance, recently most aid from the United States is in the form of foreign military financing (Figure 12). According to U.S.-Department-of-State (2014), in 2010, 2011, 2012 and 2013, US military and economic aid to Israel was approximately US\$ 2.83 billion, US\$ 3.04 billion, US\$ 3.10 billion, and US\$ 2.96 billion, respectively.

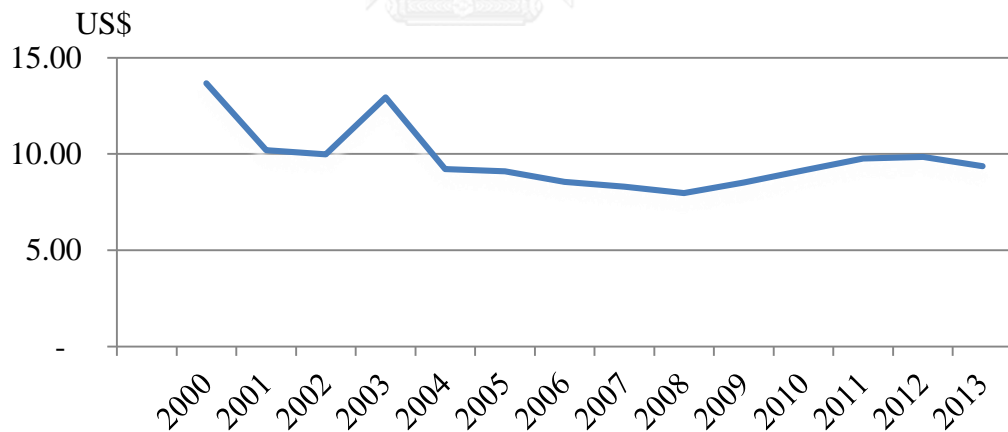
Figure 13 displays US military and economic aid to Israel per capita (this American burden is calculated by dividing the total amount of US military and economic aid to Israel by the American population). It is found that recently an American individual has provided foreign military and economic aid to Israel of more than US\$ 9 annually.

Figure 12 US military and economic aid to Israel (2000-2013)



Source: Security Assistant Monitor (2015).

Figure 13 US military and economic aid to Israel per capita (2000-2013)



Source: Security Assistant Monitor (2015); World Bank (2015b).

#### 4.6.2 The relationship between the United States and Germany

Information regarding the relations between the United States and Germany is obtained from several sources; Porter (n.d.a; n.d.b), Anonymous (n.d.), Roosevelt (n.d.), Taheri (2014), and U.S. Department of State (2015). In conclusion, the United States recognizes that the security and prosperity of the United States and Germany

significantly depend on each other. The bilateral political, security, and economic relationships are based on coordination at the most senior levels.

The US-German relations began in the 1600s. During that period of time, many Germans emigrated to North America and established communities such as Germantown near Philadelphia. They came to the United States for various reasons including economic hardship in their home country. Another huge wave of Germans emigrated to the United States in the 1840s in the aftermath of the German Revolution.

Military relations between the United States and Germany started after World War I which began with Germany, Austria-Hungary, Turkey and Bulgaria fighting Russia, France, the British Empire, Italy and Belgium. World War I began in 1914; however the United States, which initially declared its neutrality, entered World War I against Germany in 1917 after Germany began submarine warfare. Germany and its allies were defeated in 1918 and the Germany Empire disintegrated. Germany was then forced to sign the Treaty of Versailles in 1919.

The Treaty of Versailles was the peace settlement signed at the end of World War 1. The treaty was signed between Germany and the Allies. The three most important designers of this treaty were the representatives from Britain, France and the United States. Britain had two views on how Germany should be treated. The British public wanted revenge and to make Germany pay reparations. However, the representative of Britain, David Lloyd George, was concerned about the rise of communism in Russia and felt that the only country in central Europe that could stop the spread of communism from Russia was Germany. Although he wanted to punish Germany without lenience, he did not want the German people to become so disillusioned with their government that they turned to communism. Therefore, he believed that Germany should be punished but not left destitute. His private opinion was compatible with that of the United States. The United States believed that Germany had to be punished but in a way that would lead to European reconciliation as opposed to revenge whereas France believed that Germany should be punished so that it could never start a war again.



Ultimately, Britain, France and the United States seemed to be satisfied with the Treaty. In their eyes, Germany needed to be kept weak in order to maintain peace, yet strong enough to stop the spread of communism. However, German people became angry because they felt that Germany had been unfairly treated.

In 1921, a peace treaty was signed by the United States and Germany. However, this treaty, which laid the ground for a period of expanded bilateral trade and aid, was eventually revoked and the American ambassador was recalled in 1938 when numerous Jewish people were exterminated in the holocaust.

In 1939, World War II began with Germany's invasion of Poland. Initially, the United States took a neutral position. It enacted a trade embargo against all warring nations. The United States did not change its isolationist position until the fall of France and the prospect of the fall of Britain. The United States began to supply weapons to the anti-German side. Tensions escalated when US warships, which were sent to protect weapons supplies, were attacked by German submarines. The United States eventually declared war on Germany and Japan after the Japanese bombing of Pearl Harbor in 1941.

World War II began in September 1939, but the United States did not enter the war until December 1941. During this period, however, President Franklin Roosevelt of the United States prepared Americans for the inevitable war. In November 1939, Congress was persuaded to repeal the arms embargo provisions of the neutrality law so that arms could be transferred to France and Britain. In June 1940, after the fall of France, a major military buildup began, and the United States began providing aid in the form of Lend-Lease to Britain. The United States had a large capacity to produce war supplies, such as airplanes, ships, etc., for itself and its allies.

After the Japanese bombing of Pearl Harbor, the United States immediately declared war on the Axis powers. World War II created a new world order for the United States, as well as other countries. One of the major consequences was the beginning of the nuclear era. This increased pressure to decolonize the Third World. The world entered the

Cold War. The creation of the United Nations in 1941 was also the result of World War II. The war also ended the United States' relative isolation from the rest of the world. For the US economy, the war ended the Great Depression because a large number of American people went into the defense industries. In addition, American women had been encouraged to enter the labour market during the war.

World War II ended in 1945. Germany signed an unconditional surrender on May 7, 1945. Germany was divided into four zones occupied by the Soviet Union, France, Britain, and the United States. It then was divided into two parts; the Soviet-allied German Democratic Republic (East Germany) and the Western-allied Federal Republic of Germany (West Germany). The city of Berlin was split between the east and west. The Berlin Wall became a physical symbol of the Cold War.

In 1948, President Truman of the United States signed the Marshall Plan, a program of aid for war ravaged European countries. The plan led to a friendly and cooperative US-West German relationship. It helped to rebuild the economy of West Germany and provided incentives for West Germany to remain anti-communist. For the United States, this plan created reliable trading partners and provided markets for American goods.

Between 1948 and 1949 the Soviet Union attempted to cut off west Berlin from the rest of the world. However, the United States responded by flying in daily food supplies for over a year.

In 1995, the United States established diplomatic relations with West Germany. In the same year, it permitted the country to join NATO. This allowed closer relations between the two countries. The United States also established diplomatic relations with East Germany in 1974. After the fall of the Berlin Wall in 1989, East and West Germany were reunified as a single German state in 1990.

Since the end of World War II, the United States has been committed to preserving peace and security in Europe. US-German relations have been a focal point

of US involvement in Europe. Germany is an important European country. It stands at the center of European affairs. In addition, it is a key partner in US relations with European countries in the European Union and NATO.

Germany plays an important role in NATO's core mission of collective defense. As allies, troops of the United States and German troops, including maritime forces, have worked together in NATO and UN operations worldwide. They have joint training and capacity-building operations at US military installations in Germany. Furthermore, they have extended their diplomatic cooperation into military cooperation by working together in the Balkans and Africa. They also work together to encourage the evolution of open and democratic states in Central and Eastern Europe.

In brief, for the United States, the Marshall Plan and the US troop presence in Germany has left a legacy of political, military, and economic cooperation between both nations. For Germany, on the other hand, there might be resentment of defeat in World War II followed by foreign occupation, led by the United States. However, Germany might not be able to express that resentment because it needs US protection against Russia, an even more dangerous enemy.

Nevertheless, Germany has asserted its independent personality from time to time. In the 1990s, Germany attempted to develop a clandestine nuclear program. At the time, President Bill Clinton of the United States forced Germany to shut the program down by threatening them with sanctions. Germany expressed its personality again in 2003. It did not support the United States' invasion of Iraq. And now, Germany defies the United States by helping Iran to maintain its nuclear program. There is another discontentment for Germany. It is seeking an opportunity to play in the diplomatic big leagues, especially in the Security Council. However, it has no place in those leagues although it is a bigger power than Britain, France, Russia and China in per capita economic terms.

### 4.6.3 The relationship between the United States and Japan

The military relations between the United States and Japan started after the end of World War I when the United States rejected its claim to German concessions in Shantung, which it had captured at a price in blood (Buchanan, 2012).

Initially, the United States and Britain were Japan's most important trading partners. It received most of its oil from the United States and rubber from British Malaya, because it had almost none on its own islands and its sphere of influence (Columbia University, n.d.). Japan was a loyal friend of Britain. It entered World War I as a Western ally. The Britain promised to give it German concessions in Shantung, the home of Confucius. However, after Germany and its allies were defeated and the war ended in 1918, the United States denied Japan's claim when it tried to collect its share of the booty at Versailles because of the inconsiderate attitude towards China (Buchanan, 2012; National WWI Museum and Memorial, n.d.). Furthermore, in 1921, the United States pressured the British to end their 20-year alliance with Japan. Consequently, the British enraged and alienated Japan. This led Japan to be isolated, with Stalin's brooding empire to the north, a rising China to the east and to the south, and Western imperial powers that detested and distrusted it (Buchanan, 2012).

After the civil war happened in China, Japan occupied Manchuria as a buffer state in 1931. This made the Japanese army concerned about fighting the Soviet Union (Columbia University, n.d.). Japan decided to have China as a vast colony to exploit as the Britain had in India. It invaded China in 1937. After four years of fighting, it controlled the coastal cities, but not the interior (Buchanan, 2012). It moved into northern French Indochina after France capitulated in 1940. Then it moved into southern Indochina after Germany invaded Russia in 1941 to attack Dutch Indonesia to obtain its oil and British Malaya to control its rubber (Columbia University, n.d.). The United States counter-attacked by imposing an embargo on steel and scrap metal, devaluing all Japanese assets, and blocking any Japanese purchases of US oil. The Japanese Prime Minister reacted by secretly offering to give up Indochina and China, except for a buffer region in the north to protect it from Stalin, in return for the US

brokering a peace with China and opening up the oil pipeline. However, the United States spurned the offer (Buchanan, 2012).

Nonetheless, most of the American people did not want to fight with Japan since they felt that Asia was far away (Columbia University, n.d.). The United States was prepared to partially lift the oil embargo if Japan withdrew from southern Indochina. However, the proposal was vetoed by Taiwan and its American adviser. Hence, war was inevitable. Japan decided to seize the oil fields of the East Indies. Since the only force that could stop Japan was the American Pacific fleet that the United States had conveniently moved from San Diego to Honolulu, Japan attacked the US fleet at Pearl Harbor in 1941 (Buchanan, 2012). Japan thought that since the Americans did not want to fight a war against Japan, if it quickly destroyed the US fleet, the United States would simply give up and allow Japan to consolidate its grasp on the East Indies, but the Japanese military was wrong about the US reaction.

Six months after the attack on Pearl Harbor, in June 1942, the United States defeated Japan at Midway Island, which led to the steady encirclement of the Japanese islands. This cut the islands off from much-needed supplies of raw materials. The Japanese navy and air force were destroyed. The war against Japan continued until 1945 (Columbia University, n.d.). The United States dropped an atomic bomb on Hiroshima on August 6, 1945. After the Hiroshima attack, when the Japanese council was debating the surrender terms, the situation of Japan turned for the worse because the Soviet Union declared war against Japan on August 8. On August 9, 1945, the Soviet forces attacked Manchuria and rapidly overwhelmed Japan positions there, and the United States dropped a second bomb on Nagasaki. On August 15, 1945, Japan surrendered unconditionally, bringing an end to World War II. Japan and the Allied Powers led by the United States accepted Japan's surrender on September 2, 1945 (A&E Television Networks, n.d.; Web Japan, n.d.; Yale University, n.d.).

At present, Japan and the United States are close allies. US deployments have been supported by Japan due to the treaty between the two countries signed in 1951. According to the University-of-Tokyo (2015), because of World War II, Japan has been

disarmed since it surrendered in 1945. Therefore, Japan desire a security treaty with the United States to come into force simultaneously with the Treaty of Peace between the United States of America and Japan.

In the treaty between the United States and Japan that was signed on September 8, 1951, Japan agreed to grant the United States the territorial means for it to establish a military presence in the Far East. The Treaty stated that such armed forces may be used for the maintenance of international peace and security in the Far East. This meant that if the United States wanted to conduct military operations or activities in the Far East in regard to the maintenance of international peace and security, Japan had to provide financial support to the United States. Financial support from Japan encouraged the United States to deal with military activities and wars and ultimately had access to natural resources in the Far East or Eastern Asia.

One of big projects that Japan joined with the United States was research into Theater Missile Defenses (TMD). TMD is the deployment of nuclear and conventional missiles for the purpose of maintaining security in a specific region, or theatre. The aim of TMD is to protect US allies from local threats in their region or to address specific security issues and enable credibility in addressing particular threats. Primarily, TMD refers to defensive antiballistic missile systems (Encyclopedia Britannica, 2014). The TMD program consists of three sequential efforts. The first effort is the Ballistic Missile Defense Organization (BMDO) which made near term improvements to existing air and missile defense systems to enhance their ability to defend against shorter range tactical ballistic missiles. The second effort was a set of core TMD programs including PATRIOT Advanced Capability (PAC-3), Navy Area Defense, Theater High Altitude Area Defense (THAAD), and Battle Management/Command, Control & Intelligence. The third effort was the development of advanced TMD capabilities including Navy Theater Wide Defense, a Medium Extended Air Defense System and Boost Phase Intercept (Federation of American Scientists, n.d.).

Nonetheless, Japan also gained benefits from this alliance. According to Christensen (1999), the US-Japan alliance reduces threats from Japan's potential rivals;

such as China, Taiwan and Korea. The alliance has effects on regional security because China is sensitive and fears a stronger Japan. Moreover, Japan also enjoys economic benefits from the U.S-Japan alliance. As the United States claimed, Japan's checkbook diplomacy in the Gulf War was considered insufficient support for US-led efforts to protect a region that supplies Japan with the bulk of its oil.

#### **4.6.4 The US relations with the United Nations Security Council, and the North Atlantic Treaty Organization**

The United Nations Security Council and the North Atlantic Treaty Organization (NATO) are important military alliances in the world. This thesis alludes to these organizations; therefore, a brief description is provided in the following part.

##### **1) United Nations Security Council**

The United Nations Security Council (2015) consists of six main organs. According to the UN Charter, the United Nations has four purposes. The first purpose is to maintain international peace and security. The second purpose is to develop friendly relations among nations. The third purpose is to cooperate in solving international problems and in promoting respect for human rights. Finally, the fourth purpose is to be a center for harmonizing the actions of nations.

The United Nations Security Council is one of six main organs of the United Nations. It is responsible for the maintenance of international peace and security. It takes the lead in determining the existence of threats to peace or acts of aggression. It calls upon related parties to settle disputes by peaceful means. It also recommends methods of adjustment or terms of crisis management. It can resort to imposing sanctions or using armed forces to maintain or restore international peace and security. In addition, it recommends to the General Assembly the appointment of the Security Council members and the admission of new members to the United Nations. Furthermore, it works together with the General Assembly to elect the judges of the International Court of Justice. According to the UN Charter, the Security Council has the power to make

decisions that member states are obligated to implement. All members of the United Nations agree to accept and carry out the decisions of the Security Council.

The Security Council has 15 members. This number consists of 5 permanent members and 10 non-permanent members. The 5 permanent members are China, France, the Russian Federation, the United Kingdom, and the United States whereas the 10 non-permanent members are elected for two-year terms by the General Assembly. In fact, more than 60 UN members have never been members of the Security Council.

The United States is one of five permanent members of the Security Council. It plays the role of global police. It has intervened in a number of wars around the globe. Besides being a member of the UN Security Council, it is also a member of NATO.

## **2) North Atlantic Treaty Organization (NATO)**

The North Atlantic Treaty Organization (n.d.), NATO is a political and military alliance of countries from North America and Europe. It was established in 1949. The fundamental goal of NATO is to safeguard the freedom and security of its members by political and military means. Its political objective is to promote democratic values and encourage consultation and cooperation on defense and security issues to build trust and to prevent conflict. NATO is committed to the peaceful resolution of disputes. When diplomatic efforts do not succeed, it has the military capacity to conduct crisis management operations. Crisis management can involve military and non-military measures. The crisis management operations are carried out under Article 5 of the Washington Treaty or under a United Nations mandate. Article 5 of the Washington Treaty states that an attack against one ally is an attack against all NATO members. Each member of the alliance will take action in order to assist the attacked ally. NATO may work alone or in cooperation with other countries and international organizations.

When a crisis occurs, decisions on the crisis management operations are taken by the governments of each NATO member country. The decisions may include political, military or civil emergency measures. The North Atlantic Council (NAC) is



the principal political decision- making body. The duties of the NAC are to exchange information, compare different perceptions and approaches, harmonize its views and take decisions with the consensus of all NATO committee members. NAC is supported by the Political Committee, the Operations Policy Committee, the Military Committee, and the Civil Emergency Planning Committee. Over time, NATO has led and undertaken many crisis management operations in and beyond the Euro-Atlantic area.

Initially, in 1949 there were 12 members including Belgium, Canada, Denmark, France, Iceland, Italy, Luxembourg, Netherlands, Norway, Portugal, the United Kingdom, and the United States. Greece and Turkey became the members in 1952, followed by Germany in 1955, Spain in 1982, and the Czech Republic, Hungary, and Poland in 1999. After that, there were more 7 countries added including Bulgaria, Estonia, Latvia, Lithuania, Romania, Slovakia, and Slovenia, who became new NATO members in 2004. Finally, Albania and Croatia became members in 2009. Currently, there are 28 NATO members (Table 21).

Table 21 List of 28 members of the North Atlantic Treaty Organization

No.	Member name	Year of belonging	No.	Member name	Year of belonging
1	Albania	2009	15	Latvia	2004
2	Belgium	1949	16	Lithuania	2004
3	Bulgaria	2004	17	Luxembourg	1949
4	Canada	1949	18	Netherlands	1949
5	Croatia	2009	19	Norway	1949
6	Czech Republic	1999	20	Poland	1999
7	Denmark	1949	21	Portugal	1949
8	Estonia	2004	22	Romania	2004
9	France	1949	23	Slovakia	2004
10	Germany	1955	24	Slovenia	2004
11	Greece	1952	25	Spain	1982
12	Hungary	1999	26	Turkey	1952
13	Iceland	1949	27	Unite Kingdom	1949
14	Italy	1949	28	United States	1949

Source: North Atlantic Treaty Organization (n.d.).

For the United States, NATO serves as a bridge that links the US with Europeans both in NATO and the European Union. As previously stated, Germany is a key partner in these relations. Within the framework of NATO, the United States and

other members work and train together in order to be able to plan and conduct multinational crisis management operations, often at short notice. In addition, NATO's first operation under Article 5 of the Washington Treaty followed the 9/11 situation in the United States on September 11, 2001.

#### **4.7 The relationship between participation in major wars and the economic situation in military superpower countries**

##### **4.7.1 Definition**

As previously stated, a major war is an armed conflict in which at least one side consists of one or more military superpower countries that fights under a UN mandate. This definition includes proxy wars. For a war to be considered as major, at least 4,000 people must die because of war every year, and the total number of the deaths from the start date to the end date of the armed conflict must be at least 20,000. Minor wars are defined in other ways.

A proxy war, defined by Oxford Dictionaries ([www.oxforddictionaries.com](http://www.oxforddictionaries.com)), is a war that is instigated by one or more military superpower country, but does not itself become involved.

A military superpower country is a country that has enough military, political and economic power to influence wars throughout the world. In this thesis, military superpowers are Russia (formerly the Soviet Union), China, the United States, the United Kingdom, France, and Germany.

##### **4.7.2 Motivation and objective**

From 1960 to 2010, there were 4 major wars: the Vietnam War, the Gulf War, the Afghanistan War, and the Iraq War (Table 22). The major wars were influenced by military superpower countries. It is argued that the military superpower countries entered the wars for many reasons such as stopping communism, protecting oil resources, responding to

Table 22 List of majors wars during 1960-2010

No.	War Name	Side A	Side B	War time	Battle-related deaths	
					Total	Average per year <sup>1</sup>
1	Vietnam	South Vietnam <sup>2</sup>	North Vietnam <sup>3</sup>	1962–1975	1–2 million <sup>4</sup>	71,428–142,857
2	Gulf	US, UK, France, and other allies	Iraq	1990–1991	20,000–30,000 <sup>5</sup>	10,000–15,000
3	Afghanistan	US, UK, France, Germany, and other allies	Afghanistan	2001–2014	~92,000 <sup>6</sup>	~6,571
4	Iraq	US, UK, and other allies	Iraq	2003–2010	~134,000 <sup>7</sup>	~16,750

Note: <sup>1/</sup> Number of battle-related deaths per year = total number of battle-related deaths divided by war time period. <sup>2/</sup> South Vietnam was supported by the United States, China, and their allies. <sup>3/</sup> North Vietnam was supported by the Soviet Union and its allies.

Source: Uppsala Universitet (2014), <sup>4/</sup> Utah University (2015), <sup>5/</sup> Conetta (2003), <sup>6/</sup> Brown University (2015a), <sup>7/</sup> Brown University (2005b).

terrorist attacks, etc. However, it is also possible that one of the reasons why they engage in the wars is to solve domestic economic sluggishness.

History suggests that preparing for war might help a military superpower country to recover from economic recession through resource employment in the defense industry. The United States, for example, entered World War I while it was encountering economic recession. During the war, American manpower, as well as other resources, was employed to produce weapons and war supplies. As a result, the United States recovered from its economic sluggishness. In addition, the economist named Tyler Cowen (2014) wrote a piece in the New York Times entitled “The Lack of Major Wars May be Hurting Economic Growth”, stating that major wars have a positive effect on economic growth in the United States. He argued that wars, especially major wars, bring urgency to a government to spend on military technology development projects to defeat its rivals. Subsequently, preparation for war spurs technological innovation, such as computer, Internet, modern aircraft and nuclear power, and subsequently spurs economic growth. He stated that living in a largely

peaceful world, the United States would have 2% GDP growth, compared to 4% GDP growth in a bloody environment.

Given the above information, war affects the economy and it is possible that military superpowers participate in wars to stimulate economic growth or to deal with economic problems. In order to find evidence to support this conjecture, the following section investigates the relationship between the start of participation in a major war and the economic situation in military superpower countries.

### 4.7.3 Methodology

This section employs secondary panel data during the time period 1960 to 2010 of 6 military superpower countries: China, France, Russia, the United Kingdom, the United States and Germany. Panel data are obtained because they offer a better framework for statistical inference compared to other methodological approaches (Dunne and Perlo-Freeman, 2003; Kollias et al., 2007). A logistic regression model is used to evaluate the linkage between entering major wars and the economic situation in the military superpower countries. The logistic model is appropriate when the dependent variable takes one of only two possible values representing the presence or absence of interest (Part, 2009). The error terms in the regression equations are assumed serially uncorrelated error terms.

To formulate the model to investigate the relationship between entering a major war and the economic situations in military superpower countries, let  $MajorW_{it}$  denote entering a major war of country  $i$  at time  $t$ ,  $MinorW_{it}$  denote the number of minor wars of the country  $i$  at time  $t$ ,  $ArmsTrans_{it}$  denote the share of arms transfers of country  $i$  at time  $t$ , and  $Growth_{it}$  denote the relative growth of GDP of country  $i$  at time  $t$ . In this model, the relative growth of GDP is calculated by comparing the growth of GDP of country  $i$  at time  $t$  with the average growth of GDP of country  $i$  at time  $t-2$ ,  $t-1$  and  $t$ . The logistic model used to investigate the relationship between entering a major war and the predicted variables takes the following form.

$$MajorW_{it} = \varphi_1 Growth_{it} + \varphi_2 MinorW_{it-1} + \varphi_3 ArmsTrans_{it-1} + \varepsilon_{it} \quad (60)$$

where

$$MajorW_{it} = \begin{cases} 1 & \text{if country } i \text{ started a major war at time } t \\ 0 & \text{if country } i \text{ did not start a major war at time } t \end{cases}$$

$$Growth_{it} = \begin{cases} 0 & \text{if growth of country } i \text{ at time } t > \text{average growth} \\ -1 & \text{if growth of country } i \text{ at time } t < \text{average growth} \end{cases}$$

$MinorW_{it-1}$  = number of minor wars of country  $i$  at time  $t-1$

$ArmsTrans_{it-1}$  = the share of arms transfers of country  $i$  at time  $t-1$

$i$  = the United States, the United Kingdom, France, Russia, China and Germany

$t$  = 1960, ..., 2010 (It should be noted that the panel data in this part are unbalanced because the data of some countries are not available in some periods of time.).

From Equation (60), the regressors are the current value of growth of GDP ( $Growth_{it}$ ), the lagged value of number of minor wars ( $MinorWar_{it-1}$ ), and the lagged value of the share of arms transfers ( $ArmsTrans_{it-1}$ ). According to Kollias et al. (2007), the presence of the lagged values of independent variables allows us to analyze explicitly the impact of those independent variables on the dependent variable over time. If the study result shows that the lagged values of the number of minor wars ( $MinorWar_{it-1}$ ) and the share of arms transfers ( $ArmsTrans_{it-1}$ ) associate with entering a major war ( $MajorW_{it}$ ), this would represent more direct evidence of a causal effect from the regressors to  $MajorW_{it}$  than is possible to obtain in static cross-sectional designs.

Data are obtained from various sources. Growth of GDP is obtained from the World Bank (2015a). Arms transfers are obtained from Stockholm-International-Peace-Research-Institute (2012). The list of major and minor wars of each military superpower country, as shown in Table 25 (in Appendix), is obtained from Uppsala Universitet (2014), Global Policy-Forum (2005), World Statemen.org (n.d.), and Washington's Blog (2015).

#### **4.7.4 Hypothesis for the relationship between participation in major war and the economic situation in military superpower countries**

This model has three hypotheses. The first hypothesis is that a military superpower country enters a major war when it faces economic recession. This

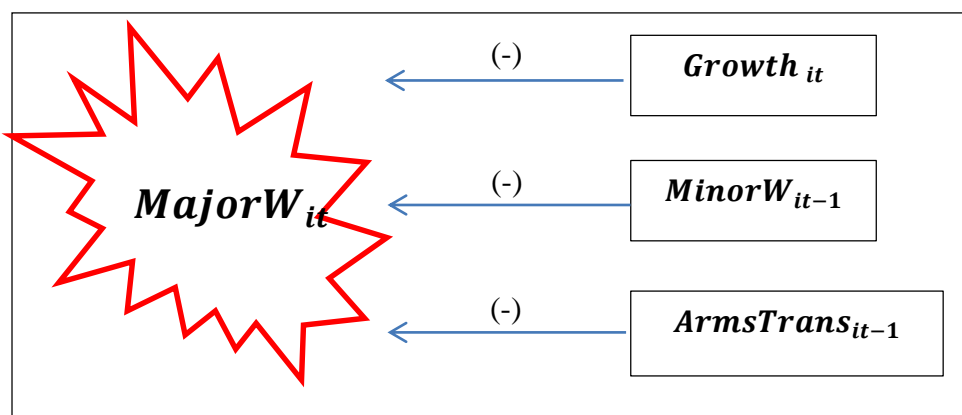
hypothesis comes from the conjecture that a military superpower country enters a major war in order to recover from an economic recession.

The second hypothesis is that if the military superpower country increases the number of minor wars, it would not enter a major war. This is because having more minor wars causes the military superpower country to incur more cost. Consequently, it might be reluctant to enter a major war.

The third hypothesis is that the lagged share of arms transfers has a negative relationship with the start of participation in a major war. This comes from the conjecture that a military superpower country needs to stock weapons for its military operations and therefore decreases its arms transfers a year before entering a major war. In addition, it is conjectured that a military superpower country uses a major war to demonstrate its high-tech conventional weapons in order to create more demand for arms. Therefore, a decrease in the share of arms transfers may encourage a military superpower country to enter a major war.

The relationship between participation in a major war and explanatory variables summarized in Figure 14.

Figure 14 The expected relationship between the start of participation in major war and explanatory variables



#### 4.7.5 Weakness of the model

The author employs this model in order to find factors that affect the decision of military superpower countries to enter a major war. Although there have been various attempts to explain the relationship between the explanatory and dependent variables, this model still has weaknesses.

1) It is hypothesized that a military superpower country enters a major war when it faces economic recession. However, a military superpower may enter a major war because of other reasons.

In the case of the Vietnam War, for instance, the main reason for the United States, China and the Soviet Union to enter this war was political. They attempted to stop the spread of their rival's political power. According to Figure 11, the United States spent a large amount of military expenditure undertaking this war. However, no explicit evidence supports the idea that the United States had an economic recession before entering this war.

Furthermore, if this hypothesis is true, France and Germany should have entered the Iraq War. Evidence shows that these two military superpower countries had economic reasons; however they did not engage directly in the war. Perhaps there were further significant factors that caused the decision as to whether or not to enter the war. Nonetheless, this hypothesis was valid for the United States, the United Kingdom, China and the Soviet Union in regard to the Iraq War.

2) It is hypothesized that if the military superpower country increases the number of minor wars, it would not enter a major war. The reason is that having more minor wars causes the military superpower country to incur more cost. As a result, it might be reluctant to enter a major war.

This hypothesis is valid only if a minor war cannot turn into a major war, or an increase in the number of minor wars cannot create a major war. However, one might

argue that some minor wars might become intensified and become a major war. In this case, the lagged number of minor wars should have a positive relationship with the start of participation in a major war.

3) It is hypothesized that a military superpower country needs to stock weapons for its military operations in a major war and therefore decrease its arms transfers a year before entering a major war. Furthermore, since a military superpower country uses a major war as a field to demonstrate its high-tech conventional weapons in order to create more demand for arms, a decrease in the share of arms transfer may encourage it to enter a major war.

However, one might argue that a military superpower country may transfer a number of weapons to its allies before starting a major war. In this case, the author conjectures that countries should detect the threat of war several years before the start of a major war. Consequently, they should prepare themselves by stocking weapons several years before entering a major war.

In addition, one might argue that a military superpower country can demonstrate its weapons in a minor war; therefore, it is not necessary to enter a major war. In this case, the author conjectures that since a major war has much more effect on demand for arms, a military superpower country may prefer to demonstrate its new weapons in a major war rather than a minor war. This is because there are more participants in a major war, and a major war creates more threat of war than a minor war.

#### **4.7.6 Analysis and discussion of the empirical results**

Before investigating the relationship between military expenditure and economic growth in arms exporting countries, the stationarity assumption was tested using the Im-Pesaran-Shin panel unit root test, which does not require a balanced panel. The null hypothesis is that all series are non-stationary against the alternative hypothesis where at least one series in the panel is stationary. The  $W$ - $t$ -bar statistic shows that *Growth*, *MinorWar*, *MajorW* and *ArmsTrans* are stationary at levels for the panel.



The next step is to investigate the impact of the regressors on the start of participation in a major war by military superpower countries using the model in equation (60). The fixed effects model is examined in the first place. As can be seen from Table 23, with the LR test statistic of 3.80, the  $H_0$  is not rejected. That means all the coefficients of the cross-section are equal to zero at a 5% significance level. This result indicates that all of the regressors do not affect entering a major war by the military superpower countries. Then, the random effects model and Wald's test are performed. The Wald test is the test for the joint significance of the estimated coefficients, which is distributed as a  $\chi^2$  under the  $H_0$  of no relationship. The result of Wald's test indicates that the regressors in the model do not affect entering a major war by the military superpower countries. Hausman test is employed to choose the appropriate model. The Hausman test is distributed as  $\chi^2$  with the degrees of freedom equal to the number of regressors under the  $H_0$  of difference in coefficients not systematic. It is found that the random effects model is more appropriate. Hence, the random effects model is used for the investigation. Bootstrap standard errors are used to correct for the presence of heteroscedasticity of unknown form. Table 23 presents the estimation results of the dynamic random effects models.

The result shows that relative economic growth has a significantly negative effect on the start of participation in a major war by the military superpower countries. This finding indicates that having an economic recession increases the log odds of entering a major war by 0.8935. This means that the military superpower countries with an economic recession are 2.44 times more likely to enter a major war than those with economic growth. This might be because entering a major war helps the military superpower to recover from economic recession through increased demand for war supplies. An increase in demand might increase the employment of manpower, as well as other resources. In addition, there might be new technology and innovations from research and development in the military sector.

Table 23 The estimation results for 6 superpower arms exporting countries  
(Sample 1960-2010)

	<i>MajorW<sub>it</sub></i>
<i>Growth<sub>it</sub></i>	-0.8935** [0.2613] (-3.4200)
<i>MinorW<sub>it-1</sub></i>	-0.2518** [0.1193] (-2.1100)
<i>ArmsTrans<sub>it-1</sub></i>	-0.0805 [0.1651] (-0.4900)
LR-Test ( $\chi^2_3$ )	3.8000
Wald Test ( $\chi^2_3$ )	3.6300
Hausman Test ( $\chi^2_3$ )	4.1700
Wald Test ( $\chi^2_3$ ) (bootstrap)	26.1600**
Number of observation	230
Number of group	6

Notes: Numbers in brackets [.] are bootstrap standard errors. Numbers in parentheses (.) are Z statistics. \*\* denotes significance level at 5%.

The result also shows that the number of minor wars has a significant negative effect on the start of participation in a major war by the military superpower countries. This implies that having one more minor war decreases the log odds of entering a major war by 0.2518. This means that if the military superpower countries have one more minor war, they are 1.29 times less likely to enter a major war than those that do not have more minor wars. This might be because if the military superpower country has more minor wars, it would not have enough resources to enter a major war.

The study result shows that the share of arms transfers is not significantly related with the start of participation in a major war by the military superpower countries. However, the sign of the coefficient is negative. This means that if its share of arms transfers decreases, the military superpower country tends to enter a major war. This

might be because the military superpower country uses a major war as a field to demonstrate its conventional weapons to increase its arms transfers.

#### **4.7.7 Conclusion**

The aim of this part is to investigate the relationship between entering a major war and the economic situation of 6 military superpower countries. The study employs a logistic regression model together with secondary panel data during the time period 1960 to 2010 for China, France, Russia, the United Kingdom, the United States and Germany.

The study result shows that the start of participation in a major war has a significantly negative relationship with the relative economic growth in the military superpower countries. This implies that the military superpower countries with economic recession are more likely to enter a major war than those with economic growth. Perhaps this is because entering a major war helps the military superpower to recover from economic recession through increasing demand for war supplies. In addition, the pressure of attempting to overcome enemies might bring new technology and innovations from research and development in the military sector. Hence, these high technological developments encourage subsequent economic growth.

It is also found that the number of minor wars has a significant negative effect on the start of participation in a major war by the military super power countries. This might be because if the military superpower countries have one more minor war, they would not have enough resources to enter a major war. Furthermore, the study result shows that the share of arms transfers does not significantly affect entering a major war by the military superpower countries. However, the sign of the coefficient indicates a negative relationship between the share of arms transfers and the start of participation in a major war. This means that if its share of arms transfers decreases, the military superpower country may enter a major war. This finding shows that perhaps the military superpower country uses a major war as a field to demonstrate its conventional weapons so as to increase its arms transfers.

## 4.8 Summary

The aims of this chapter are to describe the importance of the US defense industry; illustrate the United States' engagement with armed conflicts in foreign countries; explain the relationship between the United States and its allies, and investigate the relationship between the start of participation in a major war and the economic situation in the six military superpower countries. Using secondary data from various sources, it can be concluded as follows.

The United States is the world's largest arms exporting country. Similar to world arms transfers, US arms transfers have fluctuated over time largely because of the world's political and economic situation, as well as the United States' foreign policy. The policies have changed over time from anti-communism to democracy building to anti-terrorism. From 2000 to 2013, Asia and the Middle East were the most important US arms buyers. Europe also imported a large number of arms from the United States. It is found that the defense industry is an important industry in the United States. It is embodied in American society. The US defense industry has used many strategies for survival, such as merging and strengthening arms industries, the development and selling of new weapons to the US government and abroad, sharing with civilian projects, privatizing in many areas previously served by the US government, lobbying in Washington, and ensuring a revolving door for key personnel to move from industry to political positions. The US defense industry has a close relationship with Congress. There is also a vital link between the US defense industry and the defense industries outside the United States. In 2010, 44 US arms companies dominated the top 100 defense corporations in the world. These companies accounted for more than 60% of total arms sales.

The United States meets all the qualifications to be a global empire, seeking hegemonic economic, political and cultural control of the world with a world-wide system of military bases, a vast and strong defense industry, and an extensive national security system. It has been involved in many armed conflicts across the globe in various roles. It has been one of five permanent members of the United Nations Security Council and a superpower active member of the United Nations. It portrays itself as a global

policeman. However, evidence shows that the United States intervenes in only some armed conflicts. It spent enormous budgets on military intervention in natural resource rich countries, especially crude oil rich countries in the Middle East. Many people argue that the United States uses its military power to promote or protect its own interests rather than calling for global peace and harmony or promoting human rights, as well as democracy, as it has vowed. It is still showing no sign of reluctance to engage in war. It is found that the United States has undertaken military intervention in armed conflicts in foreign countries almost every year. Only in 1955 and 1957 is there no evidence of US military intervention in foreign countries.

The United States has a close military relationship with many countries, especially Israel, Germany and Japan. The relationship between the United States and each of these countries is unique. US military intervention outside the United States has been officially, at least partially, supported by Israel and Japan. Without the support of Israel and Japan, the United States might not have been able to influence many armed conflicts. The close relationship with Israel and Japan links the United States and these countries to wars and natural resource exploitation. Furthermore, the most important role of Germany for the United States is as a buffer state against Russia, formerly the Soviet Union.

Using a logistic regression model together with secondary panel data during the time period 1960 to 2010 for China, France, Russia, the United Kingdom, the United States and Germany, the study result shows that economic growth has a significantly negative relationship with the start of participation in a major war by the military superpower countries. In other words, the military superpower countries with economic recession are more likely to enter a major war than those with economic growth. It is also found that the number of minor wars has a significantly negative relationship with the start of participation in a major war by the military superpower countries. In addition, the result shows that the share of arms transfers does not significantly relate with the start of participation in a major war by the military superpower countries. The negative sign of the coefficient of arms transfer, however, indicates that when their share of arms transfers decreases, the military superpower countries tend to enter a major war.

## Chapter 5

### Conclusion and Suggestions

#### 5.1 Conclusion

Countries spend a large amount of money on military expenditure to procure arms and other war supplies. A lot of arms from arms exporting countries have been transferred to countries around the world. These evidences lead to the argument that while there are a large number of sufferers, some people benefit from wars, the arms trade, as well as military expenditure. This thesis, therefore, attempts to reveal the linkage of wars, the arms trade, military expenditure, and the benefits or losses of stakeholders.

The aims of this thesis are to 1) examine the relationship between the arms trade, war participation, military expenditure, and economic situation in arms exporting countries, 2) investigate the feedback of military expenditure and economic growth in three different groups of countries; arms and oil importing countries, oil exporting but arms importing countries, and arms exporting countries, 3) study the roles of the United States in global wars, and 4) analyze the relationship between participation in major wars and economic situation in military superpower countries.

Secondary data from various sources between 1989 and 2013 are obtained to analyze the relationships between military expenditure, the arms trade, war participation, and economic conditions in three groups of countries; arms and oil importing countries, oil exporting but arms importing countries, and arms exporting countries, and in the United States.

Qualitative analysis is used to describe the phenomena of the arms trade, military expenditure, and the frequency of war participation. It is also used to evaluate the relationship between war participation and economic growth in arms exporting countries, the importance of the US defense industry, and the relationship between the United States and its key allies. In addition, quantitative analysis is employed to analyze the relationships between arms exports, military expenditure, and the frequency of war participation. Panel VAR models are

employed to investigate the relationship between military expenditure and economic growth. In addition, a panel logistic model is employed to analyze the relationship between participation in major wars and economic situation in military superpower countries.

The analysis in this thesis is performed with some limitations. The first limitation is about the definition of war and arms. War participation in this thesis includes only official war engagements because the author cannot find the number of unofficial war participations. Furthermore, war in this thesis excludes a conflict that results in fewer than 25 battle-related deaths per year or a conflict between two parties in which neither is the government of a state. Moreover, the volume of arms transfers excludes arms trade in the black and gray markets. In addition, arms in this thesis include only conventional weapons such as tanks, planes, and warships. This volume excludes small weapons, chemical weapons, and nuclear weapons.

The second limitation is about the variable in the Baro growth model. Traditionally, the variable that represents human resources is included in the model. However, the data on years of schooling, which is the proxy for the human resource investment of some of the countries of interest, are not available. Therefore, the models used in this thesis exclude this variable.

### **5.1.1 The Arms Trade, Wars, and Military Expenditure**

In the initial stages of the study, the author investigates the situations, trends, and the relationships between the arms trade, wars, and military expenditure. The study results indicate that, from 1989 to 2013, a large number of arms had been transferred to countries around the world. Most of the transferred arms were delivered to economic developing regions. The majority of transferred arms were exported from developed arms exporting countries. The United States was the world largest arms exporting country. While being the biggest arms exporting country, the United States also has the largest share of total world military expenditure.

During 1989 and 2013, there were 144 wars in 82 nations. Of these, 27 wars were intervened by at least one of the 27 arms exporting countries. Wars are affected by many factors, such as glory, dynastic interest, statization, natural resources, racial domination, ethnic cleansing, religious differences, identity, capitalism, and the acquisition of land.

The pattern of war has changed overtime. Previously, most wars were interstate wars, whereas at present, most wars are intrastate wars that are influenced by a third party. Furthermore, during the Cold War there were two military superpowers. Almost all wars were in the form of proxy wars between the communists, led by the Soviet Union, and the democratic nations, led by the United States. Since the end of the Cold War, the United States, which acts as the leader of the democratic political system, has been the sole superpower.

Some scholars argue that the pattern of war has changed from Old War to New War. Old Wars were mostly wars of nation-state formation and the struggles of superpowers in the twentieth century. These wars took a shorter time than New Wars. They fought with definite aims and battles with the definite purpose of ensuring a sought-after peace settlement, and in circumstances where the state had a monopoly, of legitimate violence. Additionally, in Old War, it was possible to separate war-time from peace-time by means of a treaty or treaties. In New Wars, however, there is no accepted government to ensure these conditions exist, and there is no distinct peace as opposed to war conditions.

Although the Cold War ended, countries still spent a large amount of money on military expenditure. North America, which includes the United States and Canada, had approximately 40% of total world military expenditure between 1989 and 2013. Meanwhile, Europe and Asia accounted for approximately 30% and 22%, respectively. It is found that arms exporting countries spend a larger size of budget on military expenditure than that of arms importing countries. In South East Asia, Singapore has been the largest military spender in ASEAN since 1995. The amount of military expenditure of Thailand decreased sharply in 1996 but climbed in 2007. Since 2011, Thailand has been the third largest military spender in ASEAN, after Singapore and Indonesia.



It is found that the arms exporting countries with high military expenditure participate in wars frequently. This implies that, for arms exporting countries, military expenditure indicates war participation. For arms exporting countries, the volume of military expenditure positively relates to the volume of arms transfers. This means that an arms exporting country with a higher volume of military expenditure tends to transfer more arms. However, the result shows that when an arms exporting country increases military expenditure by 1%, the volume of arms transfers also increases, but by less than 1%. This might be because the main purpose of increasing military expenditure is not to raise arms transfers.

The frequency of war participation of an arms exporting country has a positive relationship with the volume of arms transfers. That means an arms exporting country that engages in wars more frequently might be able to export more arms. This implies that, apart from other reasons regarding foreign policy, one of the incentives for engaging in wars might be in promoting sales of new arms.

It is likely that arms exporting countries participate in wars in foreign countries whether they are encountering economic sluggishness or not. Economically developed arms exporting countries, such as Belgium, Canada, France, the United Kingdom, and the United States, engaged in wars more frequently than economically developing arms exporting countries like Belarus, Brazil, and China. The result also shows that long term economic benefit is one of the incentives that persuade many arms exporting countries to engage in wars. This is supported by evidence that many arms exporting countries participated in wars in Afghanistan, Iraq, Kuwait and Serbia. All of these wars are related to energy resources.

In conclusion, perhaps, war participation by arms exporting countries influences both short term and long term economic benefits. In the short term, the more they participate in wars, the more arms they can export. In the long term, participating in wars might help arms exporting countries to access energy resources at a low price as well as providing the spillover benefits of military technology development.

### 5.1.2 The Feedback on Military Expenditure and Economic Growth

Military expenditure is a crucial issue. It relates to the security framework, the arms trade, wars, and economic growth. The result of this thesis indicates that, for arms and oil importing countries, the relationship between the share of military expenditure and economic growth is insignificantly negative. Theoretically, the share of military expenditure should have a significantly negative effect on economic growth. However, perhaps the military sector of these countries brings about some economic benefits by providing both military and non-military services for the civilian sector; therefore, the negative impacts of military expenditure on GDP growth are reduced. It is found that capital stock is an instrument in the economic growth of these countries. In addition, there is no evidence that supports the idea that population growth affects economic growth in these countries.

For arms and oil importing countries, the study result shows that governments spend on military expenditure regardless of GDP growth. Although it is insignificant, the study result implies that when the lagged GDP growth increases, the share of military expenditure tends to decrease. This might be because when the lagged GDP growth increases, the governments do not increase only military expenditure, but also non-military government expenditure. Since war is not a crucial issue in these countries, the change in non-military government expenditure might be larger than that of military expenditure. The results also show that the current share of military expenditure is influenced by the lagged share of military expenditure, but is not affected by the current share of investment. These findings imply that, for these countries, the current share of military expenditure depends on other factors, such as the power of the military sector, rather than economic reasons. In addition, the study result reveals that the growth of population positively affects the share of military expenditure. That means that, assuming that other factors are unchanged, when the population increases, governments provide more military services.

On the other hand, the results show that the share of military expenditure has a significantly negative effect on economic growth in oil exporting but arms importing

countries. This result indicates the crowding-out effects of military expenditure. It is found that lagged GDP growth has a positive effect on current GDP growth. It is also found that the share of investment and population growth insignificantly affect economic growth. This implies that economic growth in these countries may not depend on their capital stock and population growth. It might be because these countries utilize capital from foreign investment and imports.

It is found that, for oil exporting but arms importing countries, governments spend on military expenditure regardless of GDP growth. The sign of the coefficient of GDP growth is positive, although it is insignificant. This implies that if GDP increases, governments tend to increase the share of military expenditure, perhaps because security is a crucial issue for these countries. Additionally, no evidence supports the idea that the share of investment and population growth affect the share of military expenditure.

Empirically, the share of military expenditure has a significantly positive effect on economic growth in arms exporting countries. The result indicates the demand side effects of military expenditure on increases in resource employment in defense industries. Because arms exporting countries have defense industries, increasing military expenditure may encourage resource employment in defense industries. In addition, increases in research and development in defense industries might contribute to the supply side effect. It might lead to higher technology of armaments and hence encourage economic growth. Moreover, military expenditure might affect economic growth through security channels. Increases in security may enhance confidence and contribute to the creation of a stable and secure environment, which is conducive to economic activity. It is also found that the share of investment has a significantly positive impact on economic growth. This finding supports the fact that most arms exporting countries are technologically-developed countries, thus capital stock is instrumental to economic growth in arms exporting countries. Furthermore, no evidence supports the assertion that population growth affects economic growth in these countries.

For arms exporting countries, it is found that the share of military expenditure is insignificantly affected by GDP growth. This implies that governments spend on military expenditure regardless of GDP growth. The negative sign of the coefficient of GDP growth implies that arms exporting countries may decrease the share of military expenditure when GDP growth increases. The study result also indicates that the share of investment and the growth of population insignificantly affect the share of military expenditure in arms exporting countries. The positive sign of the coefficient of the share of investment implies that if capital stock increases, the governments of these countries may increase the share of military expenditure while the negative sign of the coefficient of the growth of population implies that the share of military expenditure may decrease if the growth of population increases.

### **5.1.3 The United States and Global Wars**

The United States has an important role in global wars. While being one of the five permanent members of the United Nations Security Council, the United States has been the world's largest arms exporting countries. In addition, it has undertaken military intervention in foreign countries in almost every year since 1946.

The United States has exported a lot of conventional arms to many countries around the world. Similar to the volume of world arms transfers, the volume of US arms transfers has fluctuated overtime. The fluctuations are due to world political and economic situations, and the United States' foreign policies. The US foreign policies have changed overtime, from anti-communism to democracy building, and to anti-international terrorism. From 2000 to 2013, Asia and the Middle East were the most important US arms importers. Europe also imported a large number of arms from the United States.

The defense industry is an important industry in the United States. It is embodied in American society. In 2010, almost 4.5 million American people were associated with the US defense industry. The US defense industry uses many strategies for survival, such as merging and strengthening arms industries, developing and selling new weapons to the US government and organizations in foreign countries, sharing civilian

projects, privatizing in many areas previously served by the US government, lobbying in Washington, and ensuring a revolving door for key personnel to move from the defense industry to political positions. The US defense industry has a close relationship with Congress. There is also a link between the US defense industry and the defense industries outside the United States. In 2010, 44 US defense corporations dominated the top 100 defense corporations in the world. These corporations accounted for more than 60% of the total arms sales in that period.

The United States is a superpower active member of the United Nations, as well as one of the five permanent members of the United Nations Security Council. It portrays itself as a global policeman. It has a world-wide system of military bases, a vast and strong defense industry, and an extensive national security system. From 1946 to 2010, the United States undertook military intervention in many countries across the globe in almost every year. However, evidences show that the United States undertook military intervention in only some countries. It spent enormous budgets on military intervention in natural resource rich countries, especially oil and gas rich countries in the Middle East. The United States vows that it uses military power to promote global peace, harmony, human rights, and democracy. However, many people argue that the United States uses its military power to promote or protect its own interests rather than other purposes. It is still showing no signs of reluctance to undertake military intervention in foreign countries.

The United States has a close military relationship with many countries, especially Israel, Germany and Japan. The relationship between the United States and each of these countries is unique. US military intervention outside the United States has been supported, at least partially, by Israel and Japan. Without the support of Israel and Japan, the United States might not be able to deploy military resources to many armed conflicts. The close relationship with Israel and Japan links the United States and these countries to wars and natural resource exploitation. On the other hand, the most important role of Germany for the United States is to be a buffer state against Russia, formerly the Soviet Union.

Today, the world is facing the threat of major war. The study results show that economic growth in military superpower countries has a significantly negative

relationship with the start of participation in a major war. The results indicate that when military superpower countries are in economic recession, they are 2.44 times more likely to enter a major war. This might be because entering a major war can help a military superpower country to recover from economic recession through an increase in demand for war supplies, as well as new technology and innovation from research and development in the military sector.

In addition, it is found that the number of minor wars has a significantly negative relationship with the start of participation in a major war by military superpower countries. The study results indicate that when military superpower countries have one more minor war, they are 1.29 times less likely to enter a major war. This might be because if a military superpower country has more minor wars, it would not have enough resources to undertake a major war. In addition, the results indicate that the share of arms transfers is insignificantly related to the start of participation in a major war by the military superpower countries. Although it is insignificant, the negative sign of the coefficient of the share arms transfers implies that when the share of arms transfers decreases, military superpower countries tend to enter a major war. The possible reason that supports this result is that perhaps military superpower countries use a major war as a field to demonstrate their new weapons to increase their share of arms transfers.

## **5.2 Suggestions**

From the study results, the author proposes suggestions as follows.

### **5.2.1 Suggestions from the study results**

1) Wars are caused by many factors; such as dynastic interest, natural resources, racial domination, ethnic cleansing, religious differences, strategic acquisition of land, identity, etc. Therefore, any country has the possibility of going to war. The pattern of war has changed. Nowadays, most wars are intrastate wars that are influenced by a third party and civilians suffer most. Almost all of these wars have historical roots. They might be traced back to previous historical events. The conflict in Southern Thailand, the Patani uprising, is

included in this type of war. In order to avoid and alleviate suffering from war, not only decision makers and persons in charge, but all people need to understand the roots and causes of a certain war. The governments, as well as other organizations, should educate the public about the roots, causes, and situation of global wars so as to find solutions to the problems together.

2) The study results show an insignificantly negative impact of the share of military expenditure on economic growth in arms and oil importing countries. In addition, the results indicate that the share of investment has a significant positive impact on economic growth. From these results, the decision makers of an arms and oil importing country, including Thailand, should realize that an increase in the share of military expenditure does not make the economy grow. Instead, an increase in the share of military expenditure may cause GDP growth to decline. Whereas, an increase in the share of investment encourages economic growth. Therefore, to stimulate economic growth, an increase in the share of investment is a better alternative than an increase in the share of military expenditure.

3) The study results indicate that economic recession in military superpower countries is associated with the start of participation in a major war. When military superpower countries are in economic recession, they are 2.44 times more likely to enter a major war. Today, some military superpower countries are facing economic sluggishness; therefore, the decision makers and people should prepare to cope with a major war that may occur. This conjecture is also supported by the high projections of US military expenditure. There should be a risk management plan, and people should be educated about the current situation of global war.

### **5.2.2 Future research**

1) In this thesis, the share of military expenditure in GDP is used to analyze the feedback on military expenditure and economic growth. This study, however, does not separate the proportion of spending on military by the purposes of use; such as research, hiring manpower, and procuring weapons. Besides, the optimal level of

military expenditure has not been analyzed. It might be advisable for decision makers to investigate the impact of each type of military expenditure on economic growth. Furthermore, there should be a study about the optimal military expenditure.

2) There should be a study on the scope of the warring areas, especially in Southern Thailand. The impacts of war on the warring area, as well as on the Thai economy as a whole, should be analyzed to find ways to mitigate the negative impact of that war.

3) There should be a study about the relationship between war and terrorism deep in details. Also, there should be the prediction of the outbreak of major war by using economic concerns together with other reasons.





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## APPENDIX

Table 24 Trend Indicator Values (TIVs) of arms exports from Israel, 1950-2013

(Unit: US\$ million at constant 1990 prices)

No.	Recipient country	Year							Total
		1950-1959	1960-1969	1970-1979	1980-1989	1990-1999	2000-2009	2010-2013	
1	India		32			116	1,179	2,819	2,307
2	South Africa			336	444	625	6	16	1,421
3	United States			0	124	286	626	822	1,118
4	Taiwan (ROC)			2	780	70	8	8	860
5	Turkey			0			723	1,348	822
6	Singapore		14	111	2	194	242	542	767
7	Chile			73	173	251	102	204	650
8	Sri Lanka	23		0	32	154	302	380	520
9	Colombia				121	10	90	388	447
10	China					300	56	56	350
11	Argentina			81	214	11	6	6	309
12	Mexico			40		16	209	235	262
13	Ecuador			26	152	44	33	51	253
14	South Korea			0		21	119	182	203
15	Romania					34	162	258	201
16	Brazil				8	22	85	229	197
17	Australia					40	133	245	192
18	United Kingdom			0			93	278	185
19	Italy					46	57	157	154
20	Germany (FRG)		23		20		50	113	144
21	Spain			0			50	159	135
22	Venezuela			1	55	27	44	54	126
23	Greece						120	128	120
24	Netherlands			0			92	211	119
25	Thailand			49	39	11	15	22	114
26	Myanmar	38					53	114	112
27	Indonesia			13	90			1	104
28	Equatorial Guinea						12	94	82
29	Poland						42	125	80
30	Morocco				28		40	54	69
31	Azerbaijan						16	80	64
32	El Salvador			56			4	8	60
33	Honduras			54					54
34	Uganda		18	4			29	40	52
35	Finland						46	91	45
36	SLA (Lebanon)*			0	40	5			44
37	Iran				44				43
38	Kazakhstan						32	72	40
39	Guatemala			38	1				38
40	Unknown country			0		1	12	48	38
41	Portugal						14	49	36
42	Dominican Republic							33	33
43	Viet Nam			0			18	49	31
44	Belgium					3	6	25	27
45	Slovenia			0		26			26
46	Cameroon				5	12	9	12	25
47	Nigeria						7	32	25
48	Eritrea					21			21
49	Kenya				21				21
50	LF (Lebanon)*				21				21
51	France					2	14	31	18
52	Peru					1	15	30	16
53	Rwanda						5	19	14
54	Sweden			0			14	28	14
55	Uruguay			0		14			14
56	Georgia						13	26	13
57	New Zealand							13	13
58	Angola						12	21	12
59	Paraguay							12	12
60	Zimbabwe			12					12
61	Denmark							11	11
62	Nicaragua		4	7					11
63	Papua New Guinea				11				11
64	Canada						9	18	9
65	Austria						0	8	8
66	Swaziland			7					7
67	Nepal			6					6
68	Philippines				6		0		6
69	Switzerland			0		2		2	6
70	Hungary						5	10	5
71	Bulgaria						3	6	4
72	Chad						5	10	4
73	Haiti				4				4
74	DR Congo		3						3
75	Mauritius						3	3	3
76	Russia						1	5	3
77	Seychelles							3	3
78	Czech Republic					1			2
79	Lesotho			1			1	2	2
80	Botswana					0			1
81	Cyprus						1	1	1
82	Estonia					1			1
83	Ghana		0	1					1
84	Guinea						1	1	1
85	Cote d'Ivoire						0		0
	Total	65	90	921	2,435	2,367	5,046	10,098	13,410

Remark: A '0' indicates that the value of deliveries is less than US\$0.5m.

Table 25 List of major and minor wars influenced by the six military superpower countries  
from 1960-2010

Country	Year	Major war	Minor war
China	1960		
	1961		
	1962	Vietnam War	India
	1963	Vietnam War	
	1964	Vietnam War	
	1965	Vietnam War	
	1966	Vietnam War	
	1967	Vietnam War	India
	1968	Vietnam War	
	1969	Vietnam War	Myanmar, Russia
	1970	Vietnam War	
	1971	Vietnam War	
	1972	Vietnam War	
	1973	Vietnam War	
	1974	Vietnam War	
	1975	Vietnam War	
	1976		
	1977		
	1978		North Vietnam
	1979		North Vietnam
	1980		North Vietnam
	1981		North Vietnam
	1982		
	1983		North Vietnam
	1984		North Vietnam
	1985		
	1986		North Vietnam
	1987		North Vietnam
	1988		North Vietnam
	1989		
	1990		
	1991		
	1992		
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	1995		
	1996		
	1997		
	1998		
	1999		
	2000		
	2001		
	2002		
	2003		
	2004		
	2005		
	2006		
	2007		
	2008		ETIM (East Turkestan Islamic Movement)
	2009		
	2010		

Table 25 List of major and minor wars influenced by the six military superpower countries  
from 1960-2010 (Continued)

Military superpower	Year	Major war	Minor war
France	1960		Algeria, Cameroon
	1961		Algeria, Tunisia
	1962		Algeria
	1963		
	1964		Gabon
	1965		
	1966		
	1967		
	1968		
	1969		Chad
	1970		Chad
	1971		Chad
	1972		Chad
	1973		
	1974		
	1975		
	1976		
	1977		
	1978		Chad
	1979		
	1980		
	1981		
	1982		
	1983		Lebanon, Chad
	1984		Lebanon, Chad
	1985		
	1986		Chad
	1987		Chad
	1988		
	1989		
	1990		
	1991	Gulf War	
	1992		
	1993		
	1994		
	1995		
	1996		
	1997		
	1998		
	1999		Serbia
	2000		
	2001	Afghanistan War	
	2002	Afghanistan War	
	2003		Afghanistan
	2004		Afghanistan
	2005		Afghanistan
	2006		Afghanistan, Central African Republic
	2007		Afghanistan
	2008		Afghanistan
	2009		Afghanistan
	2010		Afghanistan, Mauritania

Table 25 List of major and minor wars influenced by the six military superpower countries  
from 1960-2010 (Continued)

Military superpower	Year	Major war	Minor war
Germany	1960		
	1961		
	1962		
	1963		
	1964		
	1965		
	1966		
	1967		
	1968		
	1969		
	1970		
	1971		
	1972		
	1973		
	1974		
	1975		
	1976		
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	1982		
	1983		
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	1993		
	1994		
	1995		
	1996		
	1997		
	1998		
	1999		Serbia
	2000		
	2001	Afghanistan War	
	2002	Afghanistan War	
	2003		Afghanistan
	2004		Afghanistan
	2005		Afghanistan
	2006		Afghanistan
	2007		Afghanistan
	2008		Afghanistan
	2009		Afghanistan
	2010		Afghanistan

Table 25 List of major and minor wars influenced by the six military superpower countries  
from 1960-2010 (Continued)

Military superpower	Year	Major war	Minor war
Russia (the USSR)	1960		
	1961		
	1962	Vietnam War	
	1963	Vietnam War	
	1964	Vietnam War	
	1965	Vietnam War	
	1966	Vietnam War	
	1967	Vietnam War	
	1968	Vietnam War	
	1969	Vietnam War	China
	1970	Vietnam War	
	1971	Vietnam War	
	1972	Vietnam War	
	1973	Vietnam War	
	1974	Vietnam War	
	1975	Vietnam War	
	1976		
	1977		
	1978		
	1979		Afghanistan
	1980		Afghanistan
	1981		Afghanistan
	1982		Afghanistan
	1983		Afghanistan
	1984		Afghanistan
	1985		Afghanistan
	1986		Afghanistan
	1987		Afghanistan
	1988		Afghanistan
	1989		Afghanistan
	1990		Republic of Armenia, APF (Azerbaijan Popular Front)
	1991		Republic of Armenia
	1992		
	1993		Parliamentary Forces, Tajikistan
	1994		Chechen Republic of Ichkeria, Tajikistan
	1995		Chechen Republic of Ichkeria , Tajikistan
	1996		Chechen Republic of Ichkeria, Tajikistan
	1997		
	1998		
	1999		Chechen Republic of Ichkeria, Wahhabi movement of the Buinaksk district
	2000		Chechen Republic of Ichkeria
	2001	Afghanistan War	Chechen Republic of Ichkeria
	2002		Chechen Republic of Ichkeria
	2003		Chechen Republic of Ichkeria
	2004		Chechen Republic of Ichkeria
	2005		Chechen Republic of Ichkeria
	2006		Chechen Republic of Ichkeria
	2007		Chechen Republic of Ichkeria, Forces of the Caucasus Emirate
	2008		Forces of the Caucasus Emirate, Georgia
	2009		Forces of the Caucasus Emirate
	2010		Forces of the Caucasus Emirate

Table 25 List of major and minor wars influenced by the six military superpower countries  
from 1960-2010 (Continued)

Military superpower	Year	Major war	Minor war
The United Kingdom	1960		Malaysia
	1961		
	1962		Brunei
	1963		Malaysia
	1964		Malaysia, South Yemen
	1965		Malaysia, South Yemen
	1966		Malaysia, South Yemen
	1967		South Yemen
	1968		
	1969		Oman
	1970		Oman
	1971		Oman, PIRA (Provisional Irish Republication Army)
	1972		Oman, PIRA
	1973		Oman, PIRA
	1974		Oman, PIRA
	1975		Oman, PIRA
	1976		PIRA
	1977		PIRA
	1978		PIRA
	1979		PIRA
	1980		PIRA
	1981		PIRA
	1982		Argentina, PIRA
	1983		PIRA
	1984		PIRA
	1985		PIRA
	1986		PIRA
	1987		PIRA
	1988		PIRA
	1989		PIRA
	1990		PIRA
	1991	Gulf War	PIRA
	1992		
	1993		
	1994		
	1995		
	1996		
	1997		
	1998		PIRA
	1999		Serbia
	2000		Serbia, Sierra Leone
	2001	Afghanistan War	Serbia
	2002	Afghanistan War	
	2003	Iraq	Afghanistan
	2004	Iraq	Afghanistan
	2005	Iraq	Afghanistan
	2006	Iraq	Afghanistan
	2007	Iraq	Afghanistan
	2008	Iraq	Afghanistan
	2009	Iraq	Afghanistan
	2010	Iraq	Afghanistan

Table 25 List of major and minor wars influenced by the six military superpower countries  
from 1960-2010 (Continued)

Military superpower	Year	Major war	Minor war
The United States	1960		Congo
	1961		Cuba, Germany
	1962	Vietnam War	Cuba, Laos
	1963	Vietnam War	Ecuador, Iraq
	1964	Vietnam War	Brazil, Panama
	1965	Vietnam War	Congo, Dominican Rep., Indonesia, Laos
	1966	Vietnam War	Dominican Rep., Ghana, Guatemala, Laos
	1967	Vietnam War	Guatemala, Laos
	1968	Vietnam War	Laos
	1969	Vietnam War	Cambodia, Laos
	1970	Vietnam War	Cambodia, Laos, Oman
	1971	Vietnam War	Cambodia, Laos
	1972	Vietnam War	Cambodia, Laos
	1973	Vietnam War	Cambodia, Laos, Chile
	1974	Vietnam War	Cambodia
	1975	Vietnam War	Cambodia
	1976		Angola
	1977		Angola
	1978		Angola
	1979		Afghanistan, Angola
	1980		Afghanistan, Angola, Iran
	1981		Afghanistan, Angola, El Salvador, Libya, Nicaragua
	1982		Afghanistan, Angola, El Salvador, Lebanon, Nicaragua
	1983		Afghanistan, Angola, El Salvador, Grenada, Honduras, Lebanon, Nicaragua
	1984		Afghanistan, Angola, Iran, El Salvador, Grenada, Honduras, Lebanon, Nicaragua
	1985		Afghanistan, Angola, El Salvador, Honduras, Nicaragua
	1986		Afghanistan, Angola, Bolivia, El Salvador, Honduras, Libya, Nicaragua
	1987		Angola, El Salvador, Honduras, Iran, Nicaragua
	1988		Angola, El Salvador, Honduras, Iran, Nicaragua, Panama
	1989		Angola, El Salvador, Honduras, Libya, Nicaragua, Panama, Philippines
	1990		Angola, El Salvador, Liberia, Nicaragua, Panama
	1991	Gulf War	Angola, El Salvador, Haiti
	1992		Angola, El Salvador, Iraq, Serbia, Somalia
	1993		Bosnia-Herzegovina, Iraq, Serbia, Somalia
	1994		Bosnia-Herzegovina, Haiti, Iraq, Serbia, Somalia
	1995		Bosnia-Herzegovina, Croatia, Haiti, Iraq
	1996		Iraq
	1997		Albania, Iraq, Liberia
	1998		Iraq, Sudan
	1999		Iraq, Serbia
	2000		Iraq, Yemen
	2001	Afghanistan War	Iraq, Macedonia
	2002	Afghanistan War	Iraq, Philippines, Yemen
	2003	Iraq War	Afghanistan, Liberia
	2004	Iraq War	Afghanistan, Haiti, Pakistan, Yemen
	2005	Iraq War	Afghanistan, Haiti, Pakistan, Yemen
	2006	Iraq War	Afghanistan, Pakistan, Somalia, Yemen
	2007	Iraq War	Afghanistan, Pakistan, Somalia, Yemen

Table 25 List of major and minor wars influenced by the six military superpower countries  
from 1960-2010 (Continued)

Military superpower	Year	Major war	Minor war
The United States	2008	Iraq War	Afghanistan, Pakistan, Syria, Yemen
	2009	Iraq War	Afghanistan, Pakistan, Syria, Yemen
	2010	Iraq War	Afghanistan, Pakistan, Syria, Yemen

Source: Uppsala Universitet (2014) Grossman (2012), Global-Policy-Forum (2005), World Statemen.org (n.d.) and Washington's blog (2015).





**VITA**



