

VYSOKÁ ŠKOLA EKONOMIE A MANAGEMENTU

Nárožní 2600/9a, 158 00 Praha 5

BAKALÁŘSKÁ PRÁCE



PODNIKOVÁ EKONOMIKA

VYSOKÁ ŠKOLA EKONOMIE A MANAGEMENTU

Národní 2600/9a, 158 00 Praha 5

NÁZEV BAKALÁŘSKÉ PRÁCE/TITLE OF THESIS

Defense expenditures of North Atlantic Treaty Organization members

TERMÍN UKONČENÍ STUDIA A OBHAJOBA (MĚSÍC/ROK)

Červen 2019

JMÉNO A PŘÍJMENÍ STUDENTA / STUDIJNÍ SKUPINA

Ondřej Hindl / PE 53

JMÉNO VEDOUcíHO BAKALÁŘSKÉ PRÁCE

Ing. Dana Stará, Ph.D.

PROHLÁŠENÍ STUDENTA

Odevzdáním této práce prohlašuji, že jsem zadanou bakalářskou práci na uvedené téma vypracoval/a samostatně a že jsem ke zpracování této bakalářské práce použil/a pouze literární prameny v práci uvedené.

Jsem si vědom/a skutečnosti, že tato práce bude v souladu s § 47b zák. o vysokých školách zveřejněna, a souhlasím s tím, aby k takovému zveřejnění bez ohledu na výsledek obhajoby práce došlo.

Prohlašuji, že informace, které jsem v práci užil/a, pocházejí z legálních zdrojů, tj. že zejména nejde o předmět státního, služebního či obchodního tajemství či o jiné důvěrné informace, k jejichž použití v práci, popř., k jejichž následné publikaci v souvislosti s předpokládanou veřejnou prezentací práce, nemám potřebné oprávnění.

Datum a místo: 7/8/2018 Norfolk, VA, USA

PODĚKOVÁNÍ

Rád bych tímto poděkoval vedoucí bakalářské práce, Ing. Daně Staré, Ph.D., za metodické vedení a odborné konzultace, které mi poskytla při zpracování mé bakalářské práce.

VYSOKÁ ŠKOLA EKONOMIE A MANAGEMENTU

Nárožní 2600/9a, 158 00 Praha 5

SOUHRN

1. Cíl práce:

Cílem této bakalářské práce je zhodnotit výdaje členů Severoatlantické aliance NATO na obranu a plnění jejich závazků.

2. Výzkumné metody:

V teoretické části byla využita literární rešerše a získané data z odborné literatury zabývající se danou problematikou byly vzájemně komparovány. V praktické části bylo využito metod deskripce a komparace primárních dat. Pro stanovení vztahu mezi makroekonomickými ukazateli a cíli obranných výdajů NATO byly použity metody obsahové analýzy, dedukce a korelace. Pro vyhodnocení a formulaci doporučení bylo využito metod syntézy a dedukce.

3. Výsledky výzkumu/práce:

Pouze tři členové NATO splňují stanovená dvě procenta HDP vynaložených na obranu státu a zároveň i 20 % z rozpočtu na obranu na modernizaci armády. Německo je jedinou zemí z pěti největších členů aliance NATO, která nesplňuje ani jeden ze dvou cílů, a od roku 1999 snížila podíl výdajů na obranu o 0,05 % ekvivalentu HDP v roce 2017. Výdaje na obranu spojenců NATO přepočtené na jednoho obyvatele odpovídají pořadí zemí podle výše HDP na osobu. Je zde významná pozitivní korelace, která u členů NATO ukazuje: (1) nárůst výdajů na obranu země při růstu reálného HDP; (2) rostoucí ekvivalent podílu HDP na výdaje na obranu při rostoucím reálném HDP; (3) růst podílu HDP na obranu při růstu výdajů na obranu země a (4) nárůst výdajů na obranu země při zvětšující se rozloze země.

Deset spojenců zaznamenalo v roce 2017 snížení výdajů na obranu od roku 1999, především nejstarší členové NATO a členové, kteří jsou nejvíce geograficky vzdáleni od Ruska. Celkovým trendem pro celý východní cíp NATO je každoroční zvýšení výdajů na obranu v ekvivalentu podílu HDP, zejména od doby ruského vpádu na Ukrajinu, na jaře 2014, což lze vyhodnotit, že hrozba Ruska přispívá ke zvyšování výdajů na obranu. Při pohledu na dopad terorismu, po 9. září 2001, na výdaje na obranu členů NATO ukazuje, že hrozba terorismu by mohla přispět ke zvýšení výdajů na obranu. Na základě provedené analýzy vybraných ukazatelů a porovnání výdajů na obranu NATO lze vyvodit závěry, že ekonomická krize přerušila nárůst výdajů na obranu, ke kterému došlo po 9. září 2001. V roce 2014 došlo k nárůstu ekvivalentu HDP na obranu v řadě zemí NATO, které byly přímo postiženy útoky ISIS nebo plány, které naznačovaly hrozby útoků ISIS. Lze vyvodit, že to byl faktor, který vedl ke zvýšení výdajů na obranu.

4. Závěr:

Výzkum dospěl k závěru, že deset členů NATO v roce 2017 splnilo nebo se přiblížilo k dosažení cíle rozpočtu na obranu ekvivalentu dvou procent HDP: USA, Řecko, Estonsko, Spojené království Velké Británie, Polsko, Rumunsko, Francie, Lotyšsko, Litva a Norsko.

Třináct členů NATO splnilo v roce 2017 nebo se přiblížilo ke splnění cíle použít 20 % výdajů na obranu na hlavní vybavení a pouze tři země splnily v roce 2017 cíl dvouprocentního ekvivalentu HDP a z toho 20 % na vybavení: USA, Spojené království Velké Británie a Polsko. Na rozdíl od cíle rozpočtu dvouprocentního ekvivalentu HDP dosáhlo všech pět členů s nejvyšším HDP v NATO, cíle vynaložit 20 % výdajů na obranu na hlavní vybavení s výjimkou Německa. Celkovým trendem celého východního křídla NATO jsou zvýšené výdaje na obranu od ruské invaze na Ukrajinu v roce 2014. Podíváme-li se na dopad terorismu po útocích 9. září 2001 na obranné výdaje NATO, osmnáct zemí NATO zvýšilo své výdaje na obranu bezprostředně po 11. září a začalo zvyšovat své výdaje v letech 2002 až 2004.

KLÍČOVÁ SLOVA

Makroekonomie, rozpočet na obranu, NATO

VYSOKÁ ŠKOLA EKONOMIE A MANAGEMENTU

Národní 2600/9a, 158 00 Praha 5

SUMMARY

1. Main objective:

The objective of this bachelor thesis is to evaluate the North Atlantic Treaty Organization (NATO) members' defense spending and fulfilment of their commitment.

2. Research methods:

In the theoretical part, background research was conducted referencing primary and secondary sources. Archival research using existing publicly available databases was completed during the methodological part. In the practical part, the comparing method, as well as deduction and correlation methods were used.

3. Result of research:

Only three NATO members meet both the equivalent of two percent of GDP spent on defense and 20 percent of defense expenditure spent on major defense equipment goals. Germany is the only country in NATO's top five highest GDPs and top five most populous countries to meet neither goals and to have decreased defense spending since 1999 by 0.05 equivalent of percent GDP. An Ally's defense expenditure per capita rank is typically reflective of its overall GDP per capita rank in NATO. There is a positive significant correlation to indicate in NATO: (1) as real GDP increases, defense expenditure increases; (2) as real GDP increases, equivalent of percent GDP spent on defense increases; (3) as defense expenditure increases, equivalent of percent GDP spent on defense increases and (4) as geographical size increases, defense expenditure increases. Ten Allies have seen decrease in defense expenditure in 2017 since 1999, mainly oldest members of NATO and positioned farthest away from Russia. The overall trend for NATO's eastern flank is annual increased defense spending since the Russian incursion into Ukraine in 2014 suggesting the threat of Russia is a contributing factor to increased defense spending. Looking at the impact of post-9/11 terrorism on NATO's defense spending, the trend suggests the threat of terrorism following 9/11 could be a contributing factor to increased NATO's increased defense spending trend. NATO's defense spending patterns indicate the economic crisis interrupted defense expenditure increases, which occurred directly following 9/11. Furthermore, 2014 marked the start of a defense expenditure increase for numerous NATO countries directly affected by ISIS attacks or plots suggesting the threat of ISIS attacks may have been a contributing factor to increase defense spending.

4. Conclusions:

Research concluded that ten members of NATO met or were close to meeting the equivalent of two percent GDP goal in 2017: USA, Greece, Estonia, UK, Poland, Romania, France, Latvia, Lithuania, and Norway. Thirteen NATO members met in 2017 or were close to meeting the 20 percent of defense expenditure on major defense equipment goal and only three countries met both the equivalent of two-percent GDP and the 20 percent equipment goals in 2017: USA, the United Kingdom, and Poland. Unlike the equivalent of two percent GDP goal, all top five members with highest GDPs in NATO in 2017 have reached the goal of spending 20 percent of defense expenditure on major equipment with the exception of Germany. The overall trend for NATO's entire eastern flank is increased defense spending since the 2014 Russian incursion into Ukraine. Looking at the impact of post-9/11 terrorism on NATO's defense spending, eighteen NATO countries increased their defense spending directly following 9/11, beginning their increased spending between 2002 and 2004.

KEYWORDS

Macro economy, Defense budget, NATO

JEL CLASSIFICATION

E02 Institutions and the Macro economy
H61 Budget
H72 State and Local Budget and Expenditures

UNIVERSITY OF ECONOMICS AND MANAGEMENT

Nárožní 2600/9a, 158 00 Praha 5, Czech Republic

BACHELOR THESIS ASSIGNMENT

Name and surname:	Ondřej Hindl
Study program:	Economics and Management (Bc)
Study group:	PE 53
Title of the thesis:	Defense expenditures of North Atlantic Treaty Organization members
Content of the thesis:	<ol style="list-style-type: none">1 Introduction2 Theoretical-methodological part (North Atlantic Treaty Organization and obligations for NATO members; federal budget; defence expenditures; indicators of defence expenditures; methods)3 Practical part (relationship between defence expenditures and GDP, expenditures of federal budget and others; fulfilment of NATO obligations by its members; sorting of NATO members into groups according to selected criteria)4 Conclusions
References: (at least 4 sources)	<ul style="list-style-type: none">• CASTILLO, J. <i>Military expenditures and economic growth</i>. Santa Monica, CA : Rand, 2001. ISBN 0-8330-2896-0.• COLLINS, B. J. <i>NATO: a guide to the issues</i>. Santa Barbara, Calif. : Praeger/ABC-CLIO, 2011. ISBN 978-0-313-35492-2.• NORTH ATLANTIC TREATY ORGANIZATION, <i>Information on defence expenditures</i>. [online] 2018. Available at https://www.nato.int/cps/ic/natohq/topics_49198.htm• ROUSE, W. B. <i>The economics of human systems integration: valuation of investments in people's training and education, safety and health, and work productivity</i>. Hoboken, N.J. : Wiley, 2010. ISBN 978-0-470-48676-4.
Schedule	<ul style="list-style-type: none">• aim and methods until: 11. 06. 2018• theoretical part until: 01. 07. 2018• results until: 01. 08. 2018• final version until: 01. 09. 2018
Supervisor:	Ing. Dana Stará, Ph.D.

In Prague, 1st June 2018

Prof. Ing. Milan Žák, CSc.
Rector

Prof. Ing.
Milan
Žák CSc.

Digitálně podepsal Prof.
Ing. Milan Žák CSc.
DN: cn=Prof. Ing. Milan
Žák CSc., c=CZ, o=Vysoká
škola ekonomie a
managementu, a.s.,
givenName=Milan,
sn=Žák, serialNumber=ICA
- 10393535

Table of Contents

1	Introduction	1
2	Theoretical-Methodological Part	3
2.1	Budget	3
2.2	GDP	5
2.3	NATO and its members' commitments	5
2.3.1	Articles 3 and 5 of the North Atlantic Treaty	6
2.3.2	2014 Wales Summit Declaration	6
2.4	Factors Impacting NATO's Defense Spending	7
2.4.1	Russian Threat to NATO's Eastern Flank	7
2.4.2	NATO and post-9/11 Terrorism.....	8
2.4.3	The Economic Crisis.....	10
2.5	Methods	11
3	Practical Part	15
3.1	NATO Members and the equivalent of two-percent GDP goal	15
3.2	NATO Members and the 20 percent Major Equipment Goal	17
3.3	NATO's Real GDP and GDP per Capita.....	18
3.3.1	Correlation between Real GDP and Defense Expenditure in NATO	18
3.3.2	Correlation between Real GDP and Percent Defense Expenditures Spent on Major New Equipment.....	20
3.4	Defense Expenditure Trends from 1999-2017	22
3.4.1	Defense Expenditure per Capita Trend in NATO.....	27
3.4.2	Correlation between Defense Expenditure and Equivalent of Percent GDP spent on Defense	28
3.4.3	Correlation between Real GDP and equivalent of percent GDP spent on defense	30
3.4.4	Correlation between Defense Expenditure and Percent Defense Expenditures spent on Major New Equipment.....	32
3.5	Impacts on NATO's Defense Spending	34
3.5.1	Geographical Impacts on NATO's Defense Spending	34
3.5.2	Impact of Population Size on NATO's Defense Expenditure	36
3.5.3	NATO's Eastern Flank	39
3.5.4	Impact of post-9/11 Terrorism on NATO's defense spending	41
4	Conclusion	45
	References	
	Appendix	

List of abbreviations

CIA	Central Intelligence Agency
DefExp	Defense Expenditure in Constant 2016 USD
DF	Degrees of Freedom
EFP	Enhanced Forward Presence
EU	European Union
FY	Fiscal Year
GDP	Gross Domestic Product
H0	Null Hypothesis
H1	Hypothesis
ISAF	International Security Assistance Force
ISIS	Islamic State in Iraq and Syria
NATO	North Atlantic Treaty Organization
N	Sample Size
ns	not significant
OMB	US Office of Management and Budget
R-GDP	Real Gross Domestic Product
Rp	Pearson Correlation
SACEUR	Supreme Allied Commander Europe
SD	Standard Deviation
Signif Prob	Significant Probability
SIPRI	Stockholm International Peace Research Institute
UK	United Kingdom
US	United States
9/11	September 11, 2001
%GDP	Equivalent of Percent of GDP spent on Defense
%Equip	Percent of Defense expenditure spent on Equipment

List of graphs

Graph 1 NATO Resolute Support troops in Afghanistan (NATO members, troops)	9
Graph 2 NATO's Annual Defense expenditure as equivalent of percent GDP 1999-2017, (percent equivalent of GDP, years)	16
Graph 3 NATO's Annual Defense Expenditure 1999-2017, excludes the USA (millions USD, years)	23
Graph 4 Poland's Defense Expenditure in years 1999-2017 (billions USD, years)	39
Graph 5 NATO's Eastern Flank – Defense Expenditure 1999-2017, Poland Excluded (billions USD, years)	40
Graph 6 NATO Members reaching the 2 percent equivalent of percent GDP goal in 2017 as of their Annual Defense expenditure 1999-2017, (percent equivalent of GDP, years).....	VIII
Graph 7 NATO Members reaching the 20 percent goal in 2017 as of defense expenditure spent on major defense equipment 1999-2017, (percent of defense expenditure spent on major defense equipment, years)	VIII

List of tables

Table 1 Pearson Correlation: Real GDP and Defense Expenditure in 2000	19
Table 2 Pearson Correlation: Real GDP and Defense Expenditure in 2009	19
Table 3 Pearson Correlation: Real GDP and Defense Expenditure in 2017	20
Table 4 Pearson Correlation: Real GDP and equivalent of percent GDP Spent on Major New Equipment in 2000	21
Table 5 Pearson Correlation: Real GDP and equivalent of percent GDP Spent on Major New Equipment in 2009	21
Table 6 Pearson Correlation: Real GDP and equivalent of percent GDP Spent on Major New Equipment in 2017	22
Table 7 Pearson Correlation: Defense Expenditure and Equivalent of Percent GDP spent on Defense in 2000.....	28
Table 8 Pearson Correlation: Defense Expenditure and Equivalent of Percent GDP spent on Defense in 2009.....	29
Table 9 Pearson Correlation: Defense Expenditure and Equivalent of Percent GDP spent on Defense in 2017.....	29
Table 10 Pearson Correlation: Real GDP and equivalent of percent GDP Spent on Defense in 2000.....	30
Table 11 Pearson Correlation: Real GDP and equivalent of percent GDP Spent on Defense in 2009.....	31
Table 12 Pearson Correlation: Real GDP and equivalent of percent GDP Spent on Defense in 2017.....	31
Table 13 Pearson Correlation: Defense Expenditure and Percent Defense Expenditure Spent on Equipment in 2000	32
Table 14 Pearson Correlation: Defense Expenditure and Percent Defense Expenditure Spent on Equipment in 2009	33
Table 15 Pearson Correlation: Defense Expenditure and Percent Defense Expenditure Spent on Equipment in 2017	33
Table 16 Pearson Correlation: Geographical Size and Defense Expenditure in 2000.....	35
Table 17 Pearson Correlation: Geographical Size and Defense Expenditure in 2009.....	35
Table 18 Pearson Correlation: Geographical Size and Defense Expenditure in 2017.....	36
Table 19 Pearson Correlation: Population Size 2017 and Defense Expenditure in 2000	37
Table 20 Pearson Correlation: Population Size in 2017 and Defense Expenditure in 2009	37

Table 21 Pearson Correlation: Population Size and Defense Expenditure in 2017	38
Table 22 Basic information about NATO members	I
Table 23 NATO Members' GDP in constant 2010 USD (billions USD)	II
Table 24 NATO Members' Defense expenditures in constant 2016 USD (millions USD)	III
Table 25 NATO Eastern Flank Members' Defense expenditures (millions USD).....	IV
Table 26 NATO Members' Defense Expenditure as equivalent of percent of their GDP.....	V
Table 27 NATO Members' Equipment expenditure as percent of Defense Expenditure.....	VI
Table 28 NATO Members' 2017 Defense Expenditure per capita (USD) and NATO members' 2017 Real GDP per capita (thousands USD)	VII

1 Introduction

Following World War II, members of Western Europe realized the need for a collective defense organization. Brian Collins, a US Air Force Officer and author of "NATO: A Guide to the Issues," describes the concept of collective defense as two or more nations agreeing to cooperate in the field of defense for the benefit of all parties (Collins, 2011, p. 2). Collins (2011, p. 3) additionally states the motivation behind the original NATO members' decision for a collective defense was to counteract the Soviet Army in Eastern Europe.

For decades, United States (US) Presidents have called on the Alliance to increase its collective defense spending by meeting an equivalent of two-percent of GDP spent on defense goal in an attempt to close serious equipment capability gaps in the Alliance. During the Obama administration, these critiques became more directed and specific. In 2011, US Secretary of Defense Robert Gates, speaking in Brussels just prior to his retirement, delivered a very blunt speech to NATO about the waning US appetite to continue support of maintaining the US share of NATO defense spending at 75 percent. At that time, Gates highlighted that only five of NATO's 28 members – US, United Kingdom (UK), France, Greece, and Albania – were meeting the equivalent of two percent of gross domestic product (GDP) spent on defense, NATO's agreed goal (Gates, 2011).

On the campaign trail and since taking office in 2017, US President Donald Trump has continued the criticism of NATO's defense spending. In a May 2018 bilateral meeting with NATO Secretary General Jens Stoltenberg, Trump described the equivalent of two percent standard as a very low number, saying it should really be four percent (Trump, 2018a). Trump continued by highlighting the defense spending shortfalls of the European Union's leader, Germany, and called on Germany to demonstrate better leadership in NATO by increasing military expenditures.

In 2017, according to NATO's statistics published on its website, only five countries met the stated NATO goal of spending equivalent of two percent of a NATO member's GDP on defense: Estonia, Greece, Poland, UK, and the US (2018a). Throughout time, many theories have emerged about leading factors defense spending. Castillo (2001, p. iii) explains that while economic growth can spur a country to increase its defense spending, it is not a causal relationship. Castillo also suggests historical evidence instead suggests the most important factor contributing to increases in defense spending is a perceived threat.

Key indicators used to examine an ally's defense spending are total annual defense expenditure and defense expenditure per capita, as well as the NATO goals of equivalent of two percent of GDP spent on defense and 20 percent of defense expenditure spent on major equipment. The factors used to determine the impact on defense spending are the macroeconomic indicator of real gross domestic product (GDP), GDP per capita, geopolitical and strategic issues of Russia and counter-terrorism, and geographical and population indicators of geographical size, population in 2017, and impact of being landlocked.

Background research was conducted to find information on NATO, the NATO Treaty, its members, and members' obligations. Additionally, background research was conducted to find information on important geopolitical considerations of NATO's eastern flank and the impact of September 11, 2001 and ISIS on NATO's defense spending.

Archival and library research was conducted to build the tables which show the year of NATO membership, population, geographical size, defense expenditure, defense expenditure per capita, real GDP, real GDP per capita, equivalent of percent GDP spent on defense, percent defense expenditure spent on major equipment. Comparisons of archival research were then conducted to determine trends in defense expenditures from 1999-2017, the impact of high real

GDP in NATO on NATO members' obligations, NATO members reaching the equivalent of two percent GDP goal, and those reaching the 20 percent major equipment goal. Additionally, comparisons were made to determine the impact of geographical and population size on defense spending, as well as the impact of being landlocked on defense spending.

Comparisons were also made to determine if resurgent Russia has had an impact on defense spending on NATO's eastern flank, as well as if NATO's fight against terrorism post-9/11 impacted defense spending.

Bivariate correlation analyses were conducted to measure the strength and direction of the linear relationship between NATO members' defense expenditure and percent defense expenditure spent on equipment; NATO members' real GDP and defense expenditure; NATO members' real GDP and equivalent of percent GDP spent on defense; NATO members' real GDP and percent defense expenditure spent on major equipment; geographical size and defense expenditure; and population size and defense expenditure.

The objective of this bachelor thesis is to find factors which have impacted the North Atlantic Treaty Organization (NATO) members' defense spending since 1999. This will be accomplished by evaluating the impact of geopolitical factors and macroeconomic indicators on NATO members' defense spending.

2 Theoretical-Methodological Part

The theoretical research section of this final thesis describes NATO in the context needed to conduct the necessary research and analysis in the practical part. First, the members of NATO and their membership dates, as well as North Atlantic Treaty's Article 3 and Article 5 obligations and the 2014 NATO Wales Summit declarations will be identified and . Specifically, the outcomes of the 2014 NATO Wales Summit concerning the equivalent of two percent Gross Domestic Product (GDP) on defense and the 20-percent of defense on major equipment pledges are explained.

The key current geopolitical considerations which are impacting NATO members' defense spending considerations and military operations will be discussed. The NATO's eastern flank, a relatively new term, born from a resurgent Russia, specifically from Russian aggression in Ukraine, is described. Also discussed, is the impact of September 11, 2001 on NATO relative to defense obligations and pledges. The impact of the economic crisis on NATO's defense spending is also examined.

Three geography and population terms are also defined: Geographical size, population, and landlocked.

Four macroeconomic indicators are then defined: Real GDP, GDP per capita, Defense Expenditure, Defense Expenditure per capita, Defense Expenditure as an equivalent of Percentage of GDP, and Major Defense Equipment Expenditure as a percentage of Defense Expenditure.

2.1 Budget

As per the OMB - US Office of Management and Budget (2012, p. 14), Congress as well as the President play a major role in developing the Federal Budget in the United States of America (OMB, 2012, p. 15). The law specifies the president has to annually submit his proposed Federal budget for the next fiscal year, which begins on October 1st by the previous first Monday in February. The source further explains Congress then passes the budget resolution including the targets for total spending and revenues, surplus or deficit and allocations within the spending target. After Congress passes the budget resolution, it focuses on passing the 13 annual appropriations bills (OMB, 2012, p. 15). Once Congress authorizes those 13 bills, it begins examining the President's budget in detail, holding hearings on proposals, accepting, rejecting and changing the President's proposals until both Congress and the President approve the budget (OMB, 2012, p. 15, 16).

According to Wildavsky (2002, p. 7), public budgets apportion available financial resources among competing people and human purposes. Wildavsky (2002, p. 8) further states budgets are a means of income distribution; budgets take money from people in the form of taxes and tariffs and redistribute it those who benefit from its expenditures. The categories of distribution of "wealthy" states' budgets such as NATO countries have certain common characteristics, the source continues. Same source explains these include discretionary and mandatory (or direct) spending. Mandatory spending is typically characterized by spending that is required by law such as social programs and discretionary funding is typically characterized by annual appropriations or authorizations and includes defense spending, foreign affairs, education, energy, and all other departments and ministries characteristic of a functioning government the source adds.

Mandatory spending encompasses a large part of the budget. According to the Levit (2015, p. 3 and 7) of the Congressional Research Service, in the US, mandatory spending such as major health programs, income security, and federal and military retirements typically account for approximately 60 percent of total spending and equivalent of 12 percent of the GDP. In fiscal year (FY) 2015, for example, the US federal budget was \$3.8 trillion and represented approximately equivalent of 21 percent of the GDP (National Priorities Project, 2018). The National Priorities Project further reported that of the \$3.8 trillion in FY15, mandatory spending accounted for 64.63 percent, discretionary spending 29.34 percent, and interest on federal debt 6.03 percent, while defense spending accounted for 53.71% of discretionary spending at \$598.49 billion.

In President Donald Trump's 2019 budget request, the largest recipient of discretionary spending is the Department of Defense (\$589.5 billion), followed by Departments of Health and Human Services, Education, Veteran Affairs, Homeland Security, Energy, Nuclear Security, Housing and Urban Development, State, and the National Aeronautics and Space Administration (Trump, 2018b). Over the last 10 years, US defense spending represents equivalent of between 3.5-4.8 percent of the US GDP (NATO, 2010 and 2018a).

Looking at Europe, France's public budget breakdown is significantly different, but representative of a European public budget. According to Statista (2018b), in 2018, France's total budget is 445,298 million euro. The largest portion of the public budget was dedicated to tax repayment and abatement at approximately 120 billion euro or 26.9 percent of the budget, followed by education at 72 billion euros or 16.0 percent, defense at 42.5 billion euros or 9.6 percent, and financial commitments at 41.8 billion euros or 9.4 percent of the budget (Statista, 2018b). From 2006 to 2016, social spending in France grew from equivalent of 28 percent of the GDP to 31.5 percent by 2016 (Statista, 2018a). Total defense expenditures also increased from \$53,661 million in 2006 to \$57,358 million in 2016 (SIPRI, 2018), but the equivalent of percent GDP spent on defense in France decreased from 2.5 percent to 2.13 percent over that same period (NATO, 2010 and 2018a).

The UK's public budget for 2019 also dedicates over 50 % of its budget to what the US would deem mandatory spending. Approximately 20 percent of the budget is allocated to government pensions, 19 percent to healthcare, 14 percent to welfare; others top receivers are 11 percent to education and 6 percent to defense (Chantrill, 2018). Trading Economics (2018) reports since 2008, the UK's budget typically represents between equivalents of 41.1-47.8 percent of GDP, hitting a decade low in 2017 at 41.1 percent. Over that same decade plus, UK's defense spending has notably decreased from equivalent of 2.6 percent of GDP in 2008 to equivalent of 2.12 percent (NATO, 2010 and 2018a) along with its total defense expenditure decreasing from \$57,203 million in 2008 to \$48,383 million in 2016.

Germany's public budget for 2017 was 329.1 billion euros and represented 11.2 percent of the country's GDP (Zimmermann, 2016). Zimmermann additionally reported Germany dedicated 42.2 percent of its budget to labor and social welfare, while the military received the next largest portion of the federal budget at 11.1 percent. Over the past decade, Germany's defense expenditure has increased from \$38,441 million in 2007 to \$43,023 million in 2017 (SIPRI, 2018). Its defense spending as an equivalent of percent of the GDP as likewise reduced from 1.30 percent in 2007 to 1.24 in 2017.

2.2 GDP

Assa (2016, p. 107) says although the measurement of economic activity has been politically contingent in nature since the 17th century, the concept of GDP dates as far back as 1934. Moss (2014) defines GDP as *the measure of "the market value of all final goods and services produced within a country's borders over a given year."* He further describes the three approaches to measurement – value added, income and expenditure. Moss explains the "value added" approach is calculated by summing the value added at each stage of production, where it is defined as sales revenue without the cost of nonlabor inputs of every good and service produced within a nation which equals the nation's GDP. Moss adds the "income" measurement approach is based on the idea that added value at each stage of production is ultimately allocated to the public in the form of salaries, interest, dividends, rent and royalties which must be adjusted for items such as depreciation and indirect business taxes. Moss further describes the "expenditure" measurement approach which calculates the nation's spending on final goods and services (i.e. this approach is not meant for input into the current production of another service or good). Březina (2012, p. 47) adds that GDP does not include a shadow economy, underground transactions, legal economic activities that go unreported to the government, or illegal activities. Březina uses example of workers paid cash to avoid income and payroll taxes, gambling, prostitution and sales of stolen goods as examples of a shadow economy.

2.3 NATO and its members' commitments

Following World War II, Great Britain, France, Belgium, the Netherlands, and Luxembourg signed the Brussels Treaty in 1948, a collective defense agreement obligating members to come to the defense of any member that was attacked (US Department of State, 2018). Concurrent to the Brussels Treaty, US President Harry Truman sought to reverse the previously typical foreign policy characteristic of US isolationism, negotiating a military alliance with Western Europe outside of the United Nations Security Council framework to prevent Russia from having the ability to veto a vote (US Department of State, 2018).

Although the Brussels Treaty signatories desired restricting membership in a military alliance to members of the Brussels Treaty and the United States, the US pushed to include Canada, Iceland, Denmark, Norway, Ireland, and Portugal (US Department of State, 2018). US diplomats saw value in these additional countries' memberships: their territory formed a bridge across the Atlantic (US Department of State, 2018).

Consequently, the North Atlantic Treaty, a collective defense treaty, was signed in 1949 between the United States, Canada, Belgium, Denmark, France, Iceland, Italy, Luxemburg, the Netherlands, Norway, Portugal, and the United Kingdom (US Department of State, 2018). Since 1949, NATO has incrementally expanded from 12 original members to 29 members, with Montenegro joining most recently in 2017 (NATO, 2018b). Greece and Turkey joined in 1952, Germany in 1955, and Spain in 1982. NATO started expanding into the former Eastern Bloc countries in 1999 when Poland, Hungary, and Czech Republic joined (NATO, 2018b). Another round of expansionism into the former Eastern Bloc and former Soviet Union happened in 2004 when NATO welcomed Bulgaria, Estonia, Latvia, Lithuania, Romania, Slovakia, and Slovenia (NATO, 2018b). Croatia and Albania were some of the last members to join in 2009 (NATO, 2018b).

As far as future countries' accession to NATO, NATO Membership remains open to any European country willing to adhere to the treaty's principles, as well as contribute to North Atlantic security (NATO, 2018b).

Today NATO (2018b) states its purpose is to "*guarantee the freedom and security of its members through political and military means.*" NATO now has two more purposes beyond the collective defense mission: (1) employing political and military capabilities to manage crises; and (2) cooperative security (Deni, 2014). Deni further describes cooperative security as the actions NATO takes to promote stability and security in Europe and beyond.

NATO members do have obligations, either specifically outlined in the articles of the North Atlantic Treaty or declarations made during one of the annual NATO summits.

2.3.1 Articles 3 and 5 of the North Atlantic Treaty

Article 3 of the North Atlantic Treaty specifically states that members are responsible for maintaining and developing "*their individual and collective capacity to resist armed attack* (NATO, 2009)." While NATO now also associates Article 3 with the ability to be "resilient" to resist and recover from an armed attack or other disasters which have a civil preparedness focus, this thesis is primarily concerned with Article 3 responsibilities as it relates to defense expenditures.

Today, NATO specifically defines Article 3 responsibilities as an individual member's commitment to strengthen its resilience through the development of home defense and niche skills such as cyber defense or medical support (NATO, 2018c).

Article 3 is an often-overlooked article, but lays out important responsibilities to train, organize, and equip defense forces so that they could also assume Article 5 responsibilities if necessary (Gvosdev, 2016). Gvosdev explains NATO does not have criteria to judge if a member is negligent in its Article 3 responsibilities. Gvosdev further explains the 2014 Wales Summit pledges provide the only basis to judge a NATO member's dereliction of spending and defense resourcing or an unwillingness to abide by the treaty's terms. The specifics about the 2014 Wales Summit pledges will be explained later in this section.

Article 5 is the North Atlantic Treaty's collective defense agreement (NATO, 2009) and is the heart of the 1949 treaty. The Parties to the treaty hold that an "*armed attack against one or more of them in Europe or North America shall be considered an attack against them all*" and each member will assist the attacked Party (including the use of armed force) to restore security of the North Atlantic (NATO, 2009). Article 5 is underpinned by Article 51 of the United Nations Charter which provides an inherent right of self-defense if an armed attack occurs (NATO, 2009). Article 5 is vitally important to NATO because it connects US defensive and offensive powers to the defense of Europe (Kashmeri, 2011, p.7). Kashmeri also asserts that the reason the Cold War did not become warm was due to the deterrent threat of NATO's Article 5 (2011, p. 7). Russia knew if it attacked a NATO country, it would enter a war with the US.

2.3.2 2014 Wales Summit Declaration

Throughout the Cold War, alliance members maintained a defense spending target of equivalent of three percent of GDP (Deni, 2014, p.180). As the Cold War was ending in 1990, NATO members agreed to reduce the target of spending to equivalent of two percent GDP, but agreed to no coordinated NATO strategy (Deni, 2014, 180). NATO members began unilateral defense cuts, reducing defense spending, troop strength, and major equipment acquisitions (Deni, 2014, p. 180-81).

Concerned about NATO's ability to defend itself due to the largely permanent defense cuts, then US Secretary of Defense Robert Gates delivered a speech on the future of NATO in Brussels on June 10, 2011. Gates (2011) stated, "*The blunt reality is that there will be dwindling appetite and patience in the U.S. Congress...to expend increasingly precious funds on behalf of*

nations that are apparently unwilling to devote the necessary resources...to be serious and capable partners in their own defense." As part of an effort to increase defense spending in an era of reduced military budgets and in the wake of Russia's military intervention in Ukraine, the NATO allies pledged at the 2014 Wales Summit to spend a minimum equivalent of two percent of their GDP on defense within a decade (by 2024) with a view towards "meeting their NATO Capability Targets and filling NATO's capability shortfalls (NATO, 2014)."

The Wales Summit Declaration also addressed specifically how the Allies should spend their defense expenditures. The Allies also agreed to spend annually 20 percent or more of total defense expenditures on major new equipment, including related research & development latest by 2024 (NATO, 2014). NATO classifies the other 80 percent of defense expenditure into three categories: personnel, infrastructure, and other (NATO, 2018a).

For this thesis, only two measurable goals: equivalent of two percent of GDP on defense and 20 percent of total defense expenditures on equipment will be addressed.

2.4 Factors Impacting NATO's Defense Spending

Defense spending world-wide continually increased from 1990-2007, and increased seven percent comparing those two years (Rouse, 2010, p.80). However, in Europe, Rouse (2010, p. 80) describes defense spending decreasing significantly since the end of the Cold War until 2007: \$468 billion to \$319 billion. What are the factors then in Europe, specifically NATO, impacting defense spending?

NATO has numerous geopolitical considerations which potentially effect a country's defense spending and priorities. Two primary threats or challenges to NATO will be examined to determine their impact on defense spending: threats from NATO's eastern flank, as well as from violent extremist organizations. NATO's Supreme Allied Commander Europe (SACEUR), General Curtis M. Scaparrotti, NATO's highest-ranking military officer, briefed the US Congress in 2017 that the current European strategic environment is the most dynamic it has been in recent history (Parrish, 2017). The threats facing NATO challenge the security of a billion people in Europe, as well as its trade which represents approximately half of the world's GDP (Parrish, 2017). The practical part addresses how these two primary threats to NATO members have probably impacted its defense spending.

2.4.1 Russian Threat to NATO's Eastern Flank

On NATO's eastern flank, a resurgent Russia and its military intervention in Ukraine in 2014 forced NATO to renew its focus on Article 5 obligations (Dempsey, 2017). The threat to NATO's eastern flank is primarily focused on the three countries which directly border Russia and were formerly part of the Union of Soviet Socialist Republic (USSR): Estonia, Latvia, and Lithuania. These three countries joined NATO together in 2004, part of NATO's expansion eastward (NATO, 2018b).

After conducting multiple simulation war games, the research organization Rand Corporation, a US nonprofit and nonpartisan organization, found Russian forces could reach the outskirts of Tallin and Riga at most in 60 hours (Shlapak, 2016, p. 1). Rand Corporation additionally found that having a deterrent posture of seven brigades, including three heavy armored brigades, supported by airpower and land-based fires, could potentially prevent Russia from taking the Baltic capitals so rapidly (Shlapak, 2016, p. 1).

In light of this danger, NATO's General Scaparrotti, who dual hats as the Commander, US European Command, the US Military's senior commander in Europe and NATO's Supreme

Allied Commander in Europe has stated his top priorities are deterring Russia and defeating violent extremist organizations (Scaparrotti, 2018). NATO has consequently established the Enhanced Forward Presence (EFP) in Estonia, Latvia, Lithuania, and Poland (NATO, 2018g).

The EFP consists of four multinational battlegroups conducting rotational deployments in Estonia, Latvia, Lithuania and Poland (NATO, 2018g). NATO also notes the battle groups are led by the United Kingdom in Estonia, Canada in Latvia, Germany in Lithuania, and the United States in Poland. NATO (2018g) further reports each battlegroup is between 1,000-1,400 soldiers and their presence is intended to demonstrate that an *"attack on one Ally will be considered an attack on the whole Alliance."*

While NATO's reassurance and deterrence operations on its eastern flank are primarily in the three Baltic States and Poland, the impact of a resurgent Russia on NATO's entire geographic "eastern flank" will be considered (minus Turkey who faces completely different geopolitical considerations): Bulgaria, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, and Slovenia. These countries were also part of NATO's eastward expansion, with all of them joining NATO in 2004 except for Hungary who joined in 1999 alongside Poland (NATO, 2018b).

2.4.2 NATO and post-9/11 Terrorism

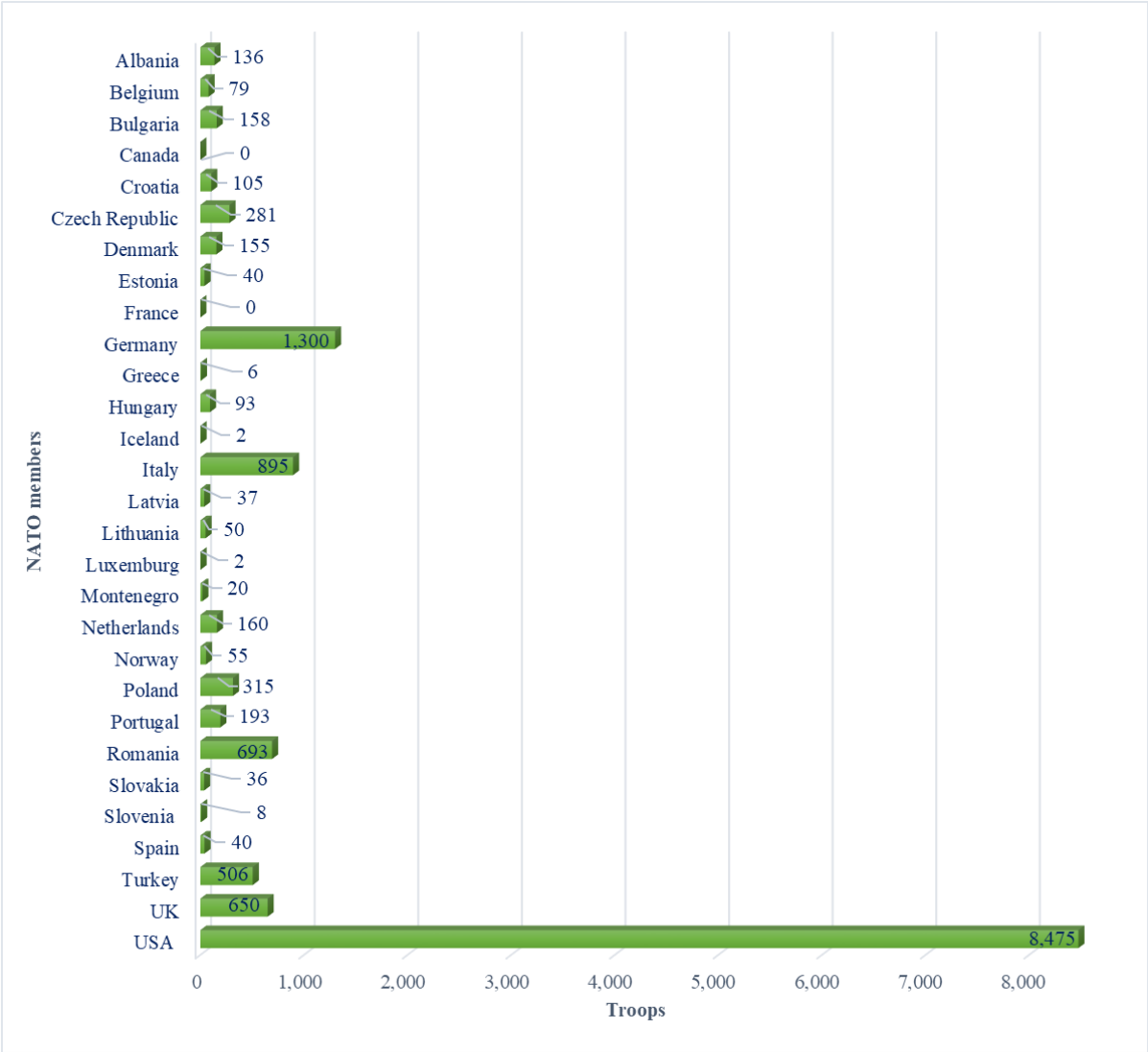
The day following the terrorist attacks in the United States on September 11, 2001, the NATO Alliance invoked Article V of the NATO Treaty for the first time in NATO's history, declaring an attack on the United States was an attack on all (Hallams, 2010, p. 1). By 2004, NATO had assumed the International Security Assistance Force (ISAF) mission in Afghanistan (Hallams, 2010, p. 64). NATO (2015) states ISAF's mission was to *"enable the Afghan government to provide effective security across the country and develop new Afghan security forces to ensure Afghanistan would never again become a safe haven for terrorists."* Hallams (2010, p. 131) writes that NATO's mission in Afghanistan began as anti-terrorism operation, a self-declared NATO responsibility with origins in NATO's 1999 Strategic Concept. NATO helped fight a new counter-insurgency in 2009, growing the ISAF mission by 40,000 extra troops (NATO, 2015).

NATO remained in the lead of ISAF until 2014, when NATO ended its combat operations in Afghanistan transitioning security to the Afghan army and police (Rasmussen, 2014). NATO (2015) states this NATO-led coalition in Afghanistan was NATO's most challenging mission to date and over 130,000 soldiers from 51 NATO and partner nations were deployed in support of the mission.

The follow-on NATO mission to ISAF is the Resolute Support Mission (RSM); the RSM to *"continue supporting the development of the Afghan security forces"* continues until today (NATO, 2018d). NATO (2018e) reports its Resolute Support's mission also aims to ensure that Afghanistan is never a safe haven for terrorism again. These 17 NATO countries participated in NATO operations in Afghanistan: Albania, Lithuania, Portugal, Denmark, Greece, Spain, Slovenia, Latvia, Estonia, Bulgaria, Slovakia, Romania, Poland, Netherlands, Canada, UK, France, and the US (Auerswald, 2014, p. 4). Additionally, all countries except for Canada and France are still serving in Afghanistan in 2018 as part of NATO's Resolute Support Mission (NATO, 2018e). As of July 2018, NATO (2018e) reports Resolute Support has approximately 16,220 troops with the 27 of 29 NATO countries contributing forces (Canada and France do not currently participate, in 2018).

The troop contribution nations and the amount of troops are illustrated in Graph 1 (NATO, 2018e).

Graph 1 NATO Resolute Support troops in Afghanistan (NATO members, troops)



Source: own processing, (NATO, 2018e)

Since 2014, NATO has also led a Defense and Related Security Capacity Building Initiative. This initiative assists NATO partners to improve their defense and security capabilities, thereby contributing to the security of the alliance (NATO, 2018f). NATO has thus far conducted defense capability building with Georgia, Iraq, Jordan, and Moldova (NATO, 2018f).

Despite NATO's work to counter terrorism and build defense capacity in countries to prevent terrorism, ISIS has conducted successful terrorist attacks since 2014 throughout NATO countries (Cafarello, 2017). Specifically, returning foreign ISIS fighters conducted coordinated attacks in Belgium, France, Germany, and the UK throughout 2014-2017 (Cafarello, 2017). Adding to the problem, Cafarello additionally noted the EU Counterterrorism Chief report at least 1,500 ISIS fighters have returned to Europe with the potential for more to return causing serious concerns for security.

This terrorism threat has directly impacted NATO and the European Union, resulting in terrorist attacks or arrests (foiled terrorist plots). Europol recently published its annual report on the status of EU's terrorism. Europol (2018) found that eight EU members who are also NATO

members suffered a terrorist attack in 2017: Spain, UK, France, Belgium, Germany, Italy, and Greece. Europol additionally reported the following NATO countries made arrests prior to a terrorist attack in 2017: Portugal, Spain, UK, Denmark, Netherlands, Belgium, France, Germany, Poland, Czech Republic, Italy, Greece, Hungary, Romania, and Bulgaria.

Of the six countries that are NATO members, but not EU members (Albania, Canada, Iceland, Norway, Turkey, and the US), all but Iceland and Norway have been recently impacted by a terrorist attack or plot. Albania in cooperation with Kosovo arrested 19 suspects in connection with a terrorist plot to attack Israeli soccer players at a World Cup qualifying match in Albania (Mejdini, 2017). ISIS has attacked North America numerous times since 2014. For example, a gunman pledging allegiance to ISIS killed 49 people at a nightclub in Florida in 2016 (Lister, Sanchez, Bixler, O'Key, Hogenmiller, and Tawfeeq, 2018). ISIS inspired attacks at Canada's National War Memorial and Parliament Hill in Ottawa killed one and injured two (The Canadian Press, 2017). Turkey has also experienced serious ISIS attacks such as the 2016 suicide attacks at Ataturk International Airport in Istanbul, Turkey killing 42 people (Yackley and Pamuck, 2016).

Defense spending from 1999 to 2017 will be examined to determine what impact 9/11 and NATO's fight against terrorism has had on NATO defense spending.

2.4.3 The Economic Crisis

The global economic crisis is estimated to have started in July 2007 in the United States (Davies, 2017). Davies described the catalyst for the crisis as a loss of confidence by US investors in the value of sub-prime mortgages which led to the US Federal Bank increasing capital in financial markets and by September 2008 global markets becoming highly volatile. Economist Gary Gorton has a slightly different view, believing the financial crisis started in August 2007 as bank run in a shadow banking system by creditors in investment banks in repo and commercial paper markets (Davies, 2010, p. 52-55).

Adebambo, Brockman, and Yan (2015) described the 2007-2008 crisis as the largest economic disruption since the Great Depression causing chaos worldwide in the form of collapsed financial institutions, bank bailouts, and stock market downturns. Braddon (2009), specifically described the impact on Europe's defense budgets. Braddon estimated the threat to defense spending would come after 2010, when public sector budgets would be under pressure to repay debts, and, thus redirect funds intended originally for defense projects.

The European Parliament found that NATO Allies reduced their defense budgets by billions of euros and, in turn, reduced investment on critical capability gaps (Gobbi, 2013). Gobbi described the EU and NATO responses to defense funding difficulties: the EU's Pooling and Sharing Initiative and NATO's Smart Defense. Both the Pooling and Sharing and Smart Defense initiatives entail cooperation, coordination, and sharing of capabilities to ensure NATO can meet its Article 3 and 5 responsibilities. Perkovich, Chalmers, Pifer, Schulte, and Tandler (2013, p. 16-17) also found that decreased defense funding across NATO could result in countries such as Germany discontinuing their dual capable aircraft capability (ability to drop nuclear and regular munitions), as well as limit NATO's ability to develop alternate non-nuclear assurance and deterrence capabilities.

2.5 Methods

The main methodological techniques of this research thesis are: background research, archival research, comparing, deduction, and correlation.

First, background research was conducted on NATO, its members, and current geo-political considerations potentially impacting NATO members' defense spending. By using background research from selected publications, an understanding of NATO was gained, helping to build the theoretical part of the thesis, specifically the data sets.

Sources from the libraries of the Interdisciplinary Center, Herzliya, Israel and the Joint Forces Staff College, Norfolk Campus, Virginia, were used to build the background information. Background research on NATO's eastern flank and NATO and 9/11 was found both in online sources, as well as at the US Joint Forces Staff College library. The main search engines used were Ebscohost, ProQuest, Gale Virtual Reference Library, Google books, Google scholar, and Safari, while the focus was on the newest sources available.

This background research helped determine the appropriate macroeconomic, geopolitical, geographical, population, and defense economic indicators appropriate to determine the impact on defense spending or highlight patterns of defense spending based on members having certain defense spending patterns.

Archival research involved gathering previously collected data on all macroeconomic indicators and basic NATO data such as population, geographical size, terrorist attacks, geography (landlocked and located on NATO's eastern flank) for the 29 members of NATO from 1999-2017. The year 1999 was chosen because it was the year that NATO started its eastward expansion, welcoming members from the former Eastern Bloc countries. This previously collected data was located in open source databases and archives and available at no cost to download. The following online data bases helped build the thesis' data set used in the practical part:

- Population, Geographical Size, and landlocked data was obtained from the CIA World Factbook (CIA, 2018);
- SIPRI provided the Defense Expenditure in 2016 Constant US\$ data (SIPRI, 2018a);
- The World Bank was the source for the data on the Real GDP (2010 Constant US\$) (The World Bank, 2018);
- NATO provided the data for defense expenditure per capita, GDP per capita, equivalent of percent GDP spent on defense and percent defense expenditure spent on equipment (NATO, 2018a; NATO, 2010; and NATO, 1999); and
- ISIS attack data was found using multiple sources such as from US and Canadian news outlets, Europol, and the Institute of War, a US non-partisan, non-profit, public policy research organization.

This thesis seeks to examine the impact of three geographical and population characteristics on defense spending: geographical size, population, and landlocked. The definition of geographical size is the Central Intelligence Agency's The World Factbook's definition (CIA, 2018): "*the sum of all land and water areas delimited by international boundaries and/or coastlines.*" The population size for each NATO country is found in the CIA World Fact Book (CIA, 2018). Population figures are as of 2017 (CIA, 2018). The definition of a landlocked country is according to the CIA World Fact Book: the country has no coast line (CIA, 2018). All countries listed as landlocked in this thesis are listed as landlocked in the CIA World Factbook (CIA, 2018).

The macroeconomic indicators of Real GDP and Defense Expenditure were used; defense expenditure further breaks down to (1) defense expenditure as equivalent of percentage of GDP and (2) major defense equipment expenditure as percentage of defense expenditure. For GDP Constant, The World Bank's definition was used. GDP Constant is the total sum of gross value added by all resident producers in the economy with the addition of product taxes and the subtraction of subsidies not included in the products' value (The World Bank, 2018). The World Bank calculates GDP Constant without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources (The World Bank, 2018). For this thesis, the data set is in constant 2010 U.S. dollars and all US dollar figures are calculated from domestic currencies using 2010 official exchange rates (The World Bank, 2018). The World Bank's (2018) data set is from the World Development Indicators Source; World Development Indicators Source cites its data from The World Bank National Accounts data and The Organization for Economic Co-operation and Development (OECD) National Accounts data files.

Defense expenditure data was gathered from the Stockholm International Peace Research Institute (SIPRI, 2018a), an independent international institute dedicated to research into conflict, armaments, arms control and disarmament. Due to the lack of a worldwide common definition, SIPRI's definition of military expenditure (i.e. defense expenditure) was used, as well as its data base for military expenditure in constant 2010 US dollars. SIPRI's (2018b) definition includes all current and capital expenditures on:

- a country's armed forces and peacekeeping forces;
- defense ministries and those ministries engaged in defense projects;
- paramilitary forces when trained and equipped for military operations; and
- military space activities (SIPRI, 2018b).

These expenditures include personnel (salaries, retirement pensions, and social services for personnel), operational and maintenance, procurements, military research and development, military infrastructure, and military aid.

This thesis's data on defense expenditure as equivalent of percentage of GDP is compiled from NATO's annual compilation of defense expenditure information (NATO, 1999; NATO, 2010; and NATO, 2018a). Likewise, the data on the Major Defense Equipment Expenditure of NATO members as a percentage of their Defense Expenditure is gathered from NATO's annual compilation of defense expenditure information. NATO's data for major defense equipment expenditure percentage includes expenditure on major equipment and research and development devoted to major equipment. (NATO, 2018a).

In the practical part of this research thesis, the statistical test of correlation and the comparing method are used to determine important relationships and impacts on defense spending. The statistical test of a correlation analysis was conducted to calculate the correlation coefficient (r) and to measure the strength of relationship or the degree of linear relationship between two variables. When variables were both continuous variables, the Pearson Correlation Coefficient (R_p), a measure of linear association between the two variables, was used to determine if a change in one variable is accompanied by a change in the other variable. The strength of the relationship is determined by the distance of the correlation coefficient (R_p) from zero. The Pearson Correlation Coefficient ranges from -1 to 1, where $-1 \leq R_p \leq 1$. The -1 is a perfect negative correlation, 0 indicates no correlation between the two variables, and 1 is a perfect positive correlation. Additionally, the following was considered: 0-0.1 as no correlation, >0.1- ≤ 0.2 as a weak correlation, >0.2- ≤ 0.3 as a weak-medium correlation, >0.3- ≤ 0.6 as a medium correlation, and >0.6- < 1.00 as a strong correlation.

For the correlation calculation, the Pearson correlation method was used because both variables were continuous variables and had a linear association. The sample correlation coefficient, R_p , is calculated by dividing the covariance ($\text{Cov}(X,Y)$) of the two variables by their standard deviations (σ_X, σ_Y).

Pearson correlation formula (Salkind, 2007, p. 750-751):

$$R_p = \frac{N\sum xy - (\sum x)(\sum y)}{\sqrt{[N\sum x^2 - (\sum x)^2][N\sum y^2 - (\sum y)^2]}} \quad (1)$$

Where:

N – number of countries or sample size (or Count)

$\sum xy$ – sum of the product of the paired scores

$\sum x$ – sum of x scores

$\sum y$ – sum of y scores

$\sum x^2$ - sum of squared x scores

$\sum y^2$ - sum of squared y scores

This actual calculation was computed using the statistical software JMP Pro 13. Once computed, the results were reported in the following format:

R_p =value, significance (if significant: $p < 0.05$, $p < 0.01$, $p < 0.001$, if not significant: $p = ns$ or $p > 0.05$)

The results were considered statistically significant or unlikely due to chance if $p < 0.05$. The conclusion and follow-on recommendation were based on information gained in theoretical part, as well as comparing of deductions made from archival research and calculation of bivariate correlation analyses in the practical part.

Descriptive Statistics are also calculated to describe both the measures of central tendency (score of the variable) and measures of dispersion (how much variety is in the scores) in order to have a single number to describe the general tendency in the distribution of a variable. For continuous variables used in this thesis, all three measures of central tendency could be calculated: mode, mean, and median. The mode is the most frequent score in the data set, mean is equal to the sum of all the scores divided by the number of scores, and median is the middle score for a set of data that has been arranged in order of magnitude. In this thesis, only the mean will be calculated and displayed in the tables after the correlational tests. The mode and median could additionally be found by sorting the data in the tables.

The measures of dispersion are range, variance, and standard deviation (SD). Range indicates the distance between the minimum and maximum. In each correlational test in this thesis, the table will indicate each minimum and maximum to highlight the range. Variance is the distance each score is from the mean. The distances are squared and summed, and then divided by the number of the scores (Nevo, 2017, p. 108). It will be calculated the SD to avoid the potential problems with variance: (1) giving more weight to extreme scores by squaring the deviations of scores from the mean; and (2) the variance (in units squared) is not measured in the same units as the scores because it is in unit. SD is expressed in the same units as the data. In this thesis, the SD is calculated as the square root of variance to show the spread of the scores. The formula used to calculate SD is:

Standard Deviation (Nevo, 2017, p. 108-9):

$$\sigma = \sqrt{\frac{\sum(x-\mu)^2}{N}} \quad (2)$$

Where:

σ = SD

\sum = sum

μ =mean

N=number of countries or sample size

x= a value in the data set

The degrees of freedom (DF) is the number of independent pieces of information that went into calculating the estimate and in this thesis, it is calculated as N-1 where N is the sample size.

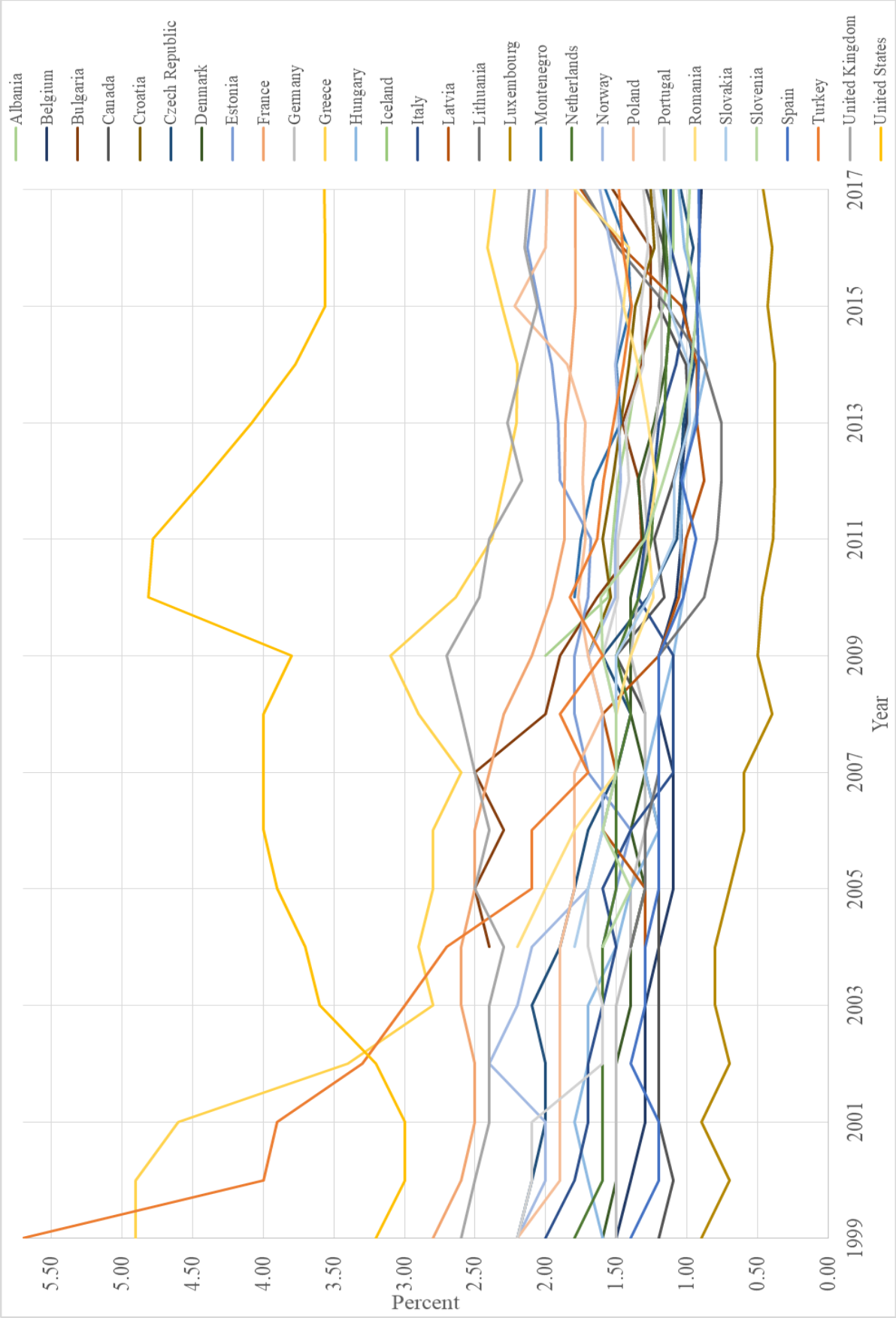
3 Practical Part

The practical part first looks at the macroeconomic indicators of defense expenditure, real GDP, and NATO's two goals by 2024: (1) spending equivalent of 2.0 percent of GDP on defense and (2) spending equivalent of 20 percent of defense expenditure on major equipment. The practical part then looks at both geographical size and population size, attempting to find correlations and noting important impacts of geographical size and population on meeting NATO's goals. Finally, the practical part addresses geo-political concerns on NATO's eastern flank, as well as the ramifications of 9/11 and terrorism.

3.1 NATO Members and the equivalent of two-percent GDP goal

As per Table 26 and Graph 5, there are only five members of NATO who meet the equivalent of two percent GDP goal in 2017: USA 3.57 percent, Greece 2.36 percent, Estonia 2.08 percent, UK 2.12 percent, and Poland 1.99 percent. The USA, UK, and Greece have historically always met the equivalent of two percent GDP goal. Estonia and Poland have met the equivalent of two percent GDP spent on defense goal since 2015.

Graph 2 NATO's Annual Defense expenditure as equivalent of percent GDP 1999-2017, (percent equivalent of GDP, years)



Source: own processing, NATO (1999), NATO (2010) and NATO (2018a)

Looking at Graph 2 and Table 26 again, there are only five other NATO members who are close to the equivalent of two percent GDP spent on defense goal in 2017: Romania 1.80 percent, France 1.79 percent, Latvia 1.75 percent, Lithuania 1.73 percent, and Norway 1.62 percent. France has stayed steady at 1.79 percent since 2015, but prior to that had steadily declined from 2.8 percent in 1999. Since 2009, Norway steadily declined from 1.7 percent and reached a low of 1.46 percent in 2015, but then spiked back up to 1.62 percent in 2017. Latvia, Lithuania, and Romania have all increased towards their equivalent of 2 percent GDP spent on defense goal since 2012. Latvia has increased from 0.88 percent in 2012 to 1.75 percent in 2017. Lithuania has increased from 0.76 percent in 2012 to 1.73 percent in 2017. Romania has increased from 1.22 percent in 2012 to 1.80 percent in 2017.

As per Table 23, the top five highest GDPs in NATO in 2017 are (1) USA \$17,305 billion; (2) Germany \$3,866 billion; (3) France \$2,960 billion; (4) UK \$2,807 billion; (5) Italy at \$2,112 billion. Comparing Tables 23 and 26, only two countries of the top five GDPs in NATO in 2017 have reached the spending equivalent of two percent GDP spent on defense pledge by 2024: USA 3.57 percent and the UK 2.12 percent. The three countries with high real GDPs in NATO in 2017 falling short of the goal: France 1.79 percent, Germany 1.24 percent, and Italy 1.12 percent.

3.2 NATO Members and the 20 percent Major Equipment Goal

As per Table 27 and Graph 7, eleven NATO members met the 20 percent of defense expenditure on major defense equipment goal in 2017: (1) Luxembourg 32.99 percent; (2) Turkey 30.4 percent; (3) Lithuania 31.09 percent, (4) Bulgaria 29.54 percent, (5) USA 28.43 percent, (6) Norway 25.52 percent, (7) France 24.17 percent, (8) Poland 22.14 percent, (9) UK 22.03 percent, (10) Italy 20.94 percent, and (11) Slovakia 20.42 percent.

Continuing to look at Table 27, Bulgaria typically does not meet the 20 percent equipment goal (and has been under 10 percent since 2011), but had one large spike in 2017 to 29.54 percent. The year 2017 was the first year Slovakia met the 20 percent equipment goal since joining NATO, increasing from 15.32 percent in 2016. Italy also met the 20 percent equipment goal for the first time in 2017 after it almost doubled its percentage from 9.72 percent in 2015 to 19.1 percent in 2016. France has met the 20 percent equipment mark since 2003. The USA and Turkey have met the 20 percent major equipment goal each year since 1999. The UK has also met the 20 percent equipment goal each year since 1999 except for briefly missing the mark in 2012. Norway has typically met the 20 percent equipment goal, falling slightly short for a brief period from 2009-2013. Poland has met the 20 percent goal since 2015.

Looking at Table 27, two other countries were close to meeting the goal in 2017: Canada 19.42 percent and Estonia 19.24 percent. Canada also had a significant spike in percent of defense expenditure spent on major defense equipment, improving from 10.61 percent in 2016 to 19.42 percent in 2017. Estonia met the 20 percent equipment goal in 2014 but decreased to 12.82 percent to 2015 and increased steadily to reach 19.24 percent in 2017.

Comparing Tables 26 and 27, only three countries met both the equivalent of two-percent GDP spent on defense and the 20 percent of defense expenditure spent on major defense equipment goals in 2017: USA, the UK, and Poland.

Comparing Tables 23 and 27, all top five highest GDPs in NATO in 2017 reached the goal of spending 20 percent of defense expenditure on major equipment with the exception of Germany at 13.75 percent (NATO, 2018a): the USA 28.43 percent, France 24.17 percent, UK 22.03 percent, Italy 20.94 percent all exceed the goal (NATO, 2018a).

3.3 NATO's Real GDP and GDP per Capita

It is important to put the NATO countries into context in terms of their rank among other NATO countries in overall real GDP and GDP per capita. Table 23 lists the countries real GDP in 2010 constant USD and ranks each NATO country by its overall 2017 GDP rank compared to other NATO members. Table 28 lists the 29 NATO countries 2017 GDP per capita in 2010 constant USD, as well as each nation's rank compared to other NATO members.

Albania has the lowest overall GDP per capita at \$4,900 in NATO and ranked second from the bottom, just ahead of Montenegro in real GDP at \$14 billion. Luxembourg interestingly has the highest GDP per capita in NATO at \$108,800 yet ranks 20th overall in real GDP at \$65 billion.

The United States' real GDP dwarfs all other NATO countries at \$17,305 billion; its GDP per capita at \$53,100 ranks 5th behind the Netherlands (\$53,700), Denmark (\$61,500), Norway (\$91,400), and Luxembourg (\$108,800).

Among European NATO countries, Germany has the top real GDP at \$3,866 billion, ranking second overall in NATO. Germany's GDP per capita ranks 8th overall in NATO at \$46,600.

Although France ranks third in NATO in real GDP at \$2,860 billion, France falls to 10th overall in GDP per capita at \$42,600. The UK and Italy follow a similar pattern. The UK ranks fourth in real GDP among NATO countries at \$2,807 billion and falls to 11th overall in GDP per capita at \$42,300. Similarly, Italy ranks fifth overall in real GDP at \$2,112 billion and falls to 12th overall in GDP per capita at \$34,900.

Among the Visegrad Four (Czech Republic, Hungary, Poland, Slovakia), Poland has the strongest real GDP and interestingly the lowest GDP per capita. Poland ranks 10th overall in real GDP at \$598 billion but falls to 23rd overall GDP per capita at \$15,500. Czech Republic falls right in the middle of the pack in terms of real GDP and GDP per capita; Czech Republic ranks 15th overall in real GDP at \$241 billion and 17th overall in GDP per capita at \$22,800. Hungary and Slovakia both fall just below the middle in real GDP and GDP per capita. In real GDP, Hungary ranks 18th overall at \$153 billion and Slovakia ranks 18th overall at \$108 billion. Both countries hold similar positions in GDP per capita. Hungary ranks 22nd overall in GDP per capita at \$15,600 and Slovakia ranks 18th overall at \$19,900.

In addition to Poland, several other countries have significant differences between their overall rank in real GDP and GDP per capita. Turkey ranks 8th overall in real GDP at \$1,206 billion but falls significantly to 25th overall among NATO countries in GDP per capita at \$14,800. Conversely, Norway ranks 12th overall in real GDP at \$482 billion, but shoots to second overall in GDP per capita at \$91,400. Denmark similarly ranks 13th overall in real GDP at \$355 billion and third overall in GDP per capita at \$61,500.

The Baltic Countries all rank towards the bottom of NATO in both real GDP and GDP per capita. For real GDP, Estonia ranks 26th at \$25 billion, Latvia 25th at \$30 billion, and Lithuania 24th at \$47 billion. For GDP per capita, the Baltic states rank a little better overall, but still in the bottom third. Estonia ranks 19th overall in GDP per capita at \$18,800, Lithuania 20th overall at \$16,700, and Latvia 21st overall at \$15,700.

3.3.1 Correlation between Real GDP and Defense Expenditure in NATO

In order to test the correlation between real GDP and defense expenditure, a Pearson correlation was run in JMP Pro 13 software because both variables are continuous variables. This correlational test was conducted three times: 2000 (pre-9/11), 2009, and 2017. For the first test in 2000, only 27 NATO countries are tested; Montenegro was not yet a country in 2000 and Iceland has no military and zero defense expenditure. For the 2009 and 2017 calculation,

Montenegro is included, only Iceland remains out of the calculations. All data for the calculation of the Pearson calculation was taken from Tables 23 (Real GDP Constant 2010 USD) and 24 (Defense Expenditure Constant 2016 USD).

The null hypothesis H0 is the variables (real GDP and defense expenditure) are independent. There is no correlation between the two variables. The H1 hypothesis is the variables are dependent. There is a positive correlation between real GDP and defense expenditure, as real GDP increases, defense expenditure increases.

Table 1 Pearson Correlation: Real GDP and Defense Expenditure in 2000

Pairwise Correlations							
Variable	by Variable	Correlation	Count	Lower 95 %	Upper 95 %	Signif Prob	
DefExp 2000	R-GDP 2000	0.9839	27	0.9646	0.9927	<0,0001	
Univariate Simple Statistics							
Column	N	DF	Mean	Std Dev	Sum	Min	Max
R-GDP 2000	28	27	1,021.57	2,441.06	28,604.0	3.00	12,713.0
DefExp 2000	27	26	25,493.3	80,342.1	688,320	80.40	420,496

Source: own processing, SIPRI (2018a), The World Bank (2018)

As seen above in Table 1, for the year 2000, the results reject the null hypothesis (H0) and reveal a positive, strong significant correlation between the variables $R_p(27) = 0.9839$, $p < 0.001$. Therefore, as real GDP increases, defense expenditure increases. The significant correlation indicates the probability is low that the correlation between real GDP and defense expenditure is random. The average level of defense expenditure in 2000 in the sample is \$25,493 million with a standard deviation (SD) of \$80,342 million. The average level of real GDP in the sample is \$1,021 billion with a SD of \$28,604 billion.

Table 2 Pearson Correlation: Real GDP and Defense Expenditure in 2009

Pairwise Correlations							
Variable	by Variable	Correlation	Count	Lower 95 %	Upper 95 %	Signif Prob	
DefExp 2009	R-GDP 2009	0.9749	28	0.9459	0.9885	<0.0001	
Univariate Simple Statistics							
Column	N	DF	Mean	Std Dev	Sum	Min	Max
R-GDP 2009	28	27	1,165.11	2,784.25	32,623.0	4.00	14,595.0
DefExp 2009	28	27	37,260.7	140,262	1,043,300	68.00	747,940

Source: own processing, SIPRI (2018a), The World Bank (2018)

Table 2 above shows for the year 2009, the sample size is 28 countries (N=28), as per Table 2. The results reject the null hypothesis (H0) and reveal a positive, strong significant correlation between the variables $R_p(28) = 0.9749$, $p < 0.001$, showing again that in NATO as real GDP increases, defense expenditure increases. The significant correlation indicates the probability is low that the correlation between real GDP and defense expenditure is random. The average real

GDP in 2009 is \$1,165.1 billion with an SD of \$2,784.3 billion. The average level of defense expenditure in 2009 in the sample is \$37,260.7 million with an SD of \$140,262 million.

Table 3 Pearson Correlation: Real GDP and Defense Expenditure in 2017

Pairwise Correlations							
Variable	by Variable	Correlation	Count	Lower 95 %	Upper 95 %	Signif Prob	
DefExp 2017	R-GDP 2017	0.9816	28	0.9602	0.9916	<0.0001	
Univariate Simple Statistics							
Column	N	DF	Mean	Std Dev	Sum	Min	Max
R-GDP 2017	28	27	1,356.71	3,292.95	37,988.0	5.00	17,305.0
DefExp 2017	28	27	31,554.1	111,929	883,515	71.70	597,178

Source: own processing, SIPRI (2018a), The World Bank (2018)

Table 3 above displays for the year 2017, the sample size is 28 countries (N=28). The results reject the null hypothesis (H0) and reveal a positive, strong significant correlation between the variables $R_p(28) = 0.9816$, $p < 0.001$ and as real GDP increases, defense expenditure increases. The significant correlation indicates the probability is low that the correlation between real GDP and defense expenditure is random. The average real GDP in 2017 is \$1,356.7 billion with an SD of \$9,293 billion. The average level of defense expenditure in 2017 in the sample is \$31,554.1 million with an SD of \$111,929 million.

3.3.2 Correlation between Real GDP and Percent Defense Expenditures Spent on Major New Equipment

In order to test the correlation between real GDP and percent defense expenditures spent on major new equipment, a Pearson correlation was run in JMP Pro 13 software because both variables are continuous variables. This correlational test was conducted three times: 2000, 2009, and 2017. All data for these correlational tests can be found in Tables 23 and 27.

The null hypothesis H0 is the variables (real GDP and percent Equipment) are independent. There is no correlation between the two variables.

The H1 hypothesis is the variables are dependent. There is a positive correlation between real GDP and percent defense expenditure spent on major new equipment, as real GDP increases, percent equipment increases.

Table 4 Pearson Correlation: Real GDP and equivalent of percent GDP Spent on Major New Equipment in 2000

Pairwise Correlations							
Variable	by Variable	Correlation	Count	Lower 95 %	Upper 95 %	Signif Prob	
%Equip 2000	R-GDP 2000	0.2966	18	-0.1976	0.6706	0.2319	
Univariate Simple Statistics							
Column	N	DF	Mean	Std Dev	Sum	Min	Max
R-GDP 2000	28	27	1,021.57	2,441.06	28,604.0	3.00	12,713.0
%Equip 2000	18	17	15.4111	6.7061	277.40	4.60	28.30

Source: own processing, The World Bank (2018), NATO (2018a), NATO (1999) and NATO (2010)

According to the above Table 4, for the first test in 2000, the sample size is 18 NATO countries; Montenegro was not yet a country, Iceland has no military and zero defense expenditure, and 10 other countries were not yet NATO members (Albania, Bulgaria, Croatia, Estonia, Latvia, Lithuania, Montenegro, Romania, Slovakia, and Slovenia).

The results do not reject the null hypothesis. In a sample of 18 countries (N=18), no correlation was found between the real GDP and percent defense expenditure spent on major new equipment in 2000. Pearson's Correlation $R_p=0.2966$, $p=ns$. The average level of real GDP in 2000 in the sample is \$1,021.6 billion with an SD of \$2,441.1 billion. The average percent of defense expenditures spent on major equipment is 15.41 with an SD of 6.71 percent.

Table 5 Pearson Correlation: Real GDP and equivalent of percent GDP Spent on Major New Equipment in 2009

Pairwise Correlations							
Variable	by Variable	Correlation	Count	Lower 95 %	Upper 95 %	Signif Prob	
%Equip 2009	R-GDP 2009	0.4578	27	0.0942	0.7137	0.0163	
Univariate Simple Statistics							
Column	N	DF	Mean	Std Dev	Sum	Min	Max
R-GDP 2009	28	27	1,165.11	2,784.25	32,623.0	4.00	14,595.0
%Equip 2009	27	26	16.6704	6.8210	450.100	5.40	30.00

Source: own processing, The World Bank (2018), NATO (2018a) NATO (1999) and NATO (2010)

Table 5 indicates for the 2009 test, the sample size is 27 countries; Iceland remains out of the calculation and Montenegro did not join NATO until 2017. The results reject the null hypothesis (H0) and reveal a positive, medium strong significant correlation between the variables $R_p(27) = 0.4578$, $p<0.05$, indicating that in NATO as real GDP increases, percent defense expenditure

spent on major new equipment increases. The significant correlation indicates the probability is low that the correlation between real GDP and percent equipment is random. The average real GDP in 2009 is \$1,165.1 billion with an SD of \$2,784.3 billion. The average percent defense expenditure spent on major equipment in 2009 is 16.67 with an SD of 6.82 percent.

Table 6 Pearson Correlation: Real GDP and equivalent of percent GDP Spent on Major New Equipment in 2017

Pairwise Correlations							
Variable	by Variable	Correlation	Count	Lower 95 %	Upper 95 %	Signif Prob	
%Equip 2017	R-GDP 2017	0,2454	28	-0.1406	0.5666	0.2082	
Univariate Simple Statistics							
Column	N	DF	Mean	Std Dev	Sum	Min	Max
R-GDP 2017	28	27	1,356.71	3,292.95	37,988.0	5.00	17,305.0
%Equip 2017	18	27	18.7318	8.5746	524.490	4.010	33.20

Source: own processing, The World Bank (2018), NATO (2018a) NATO (1999) and NATO (2010)

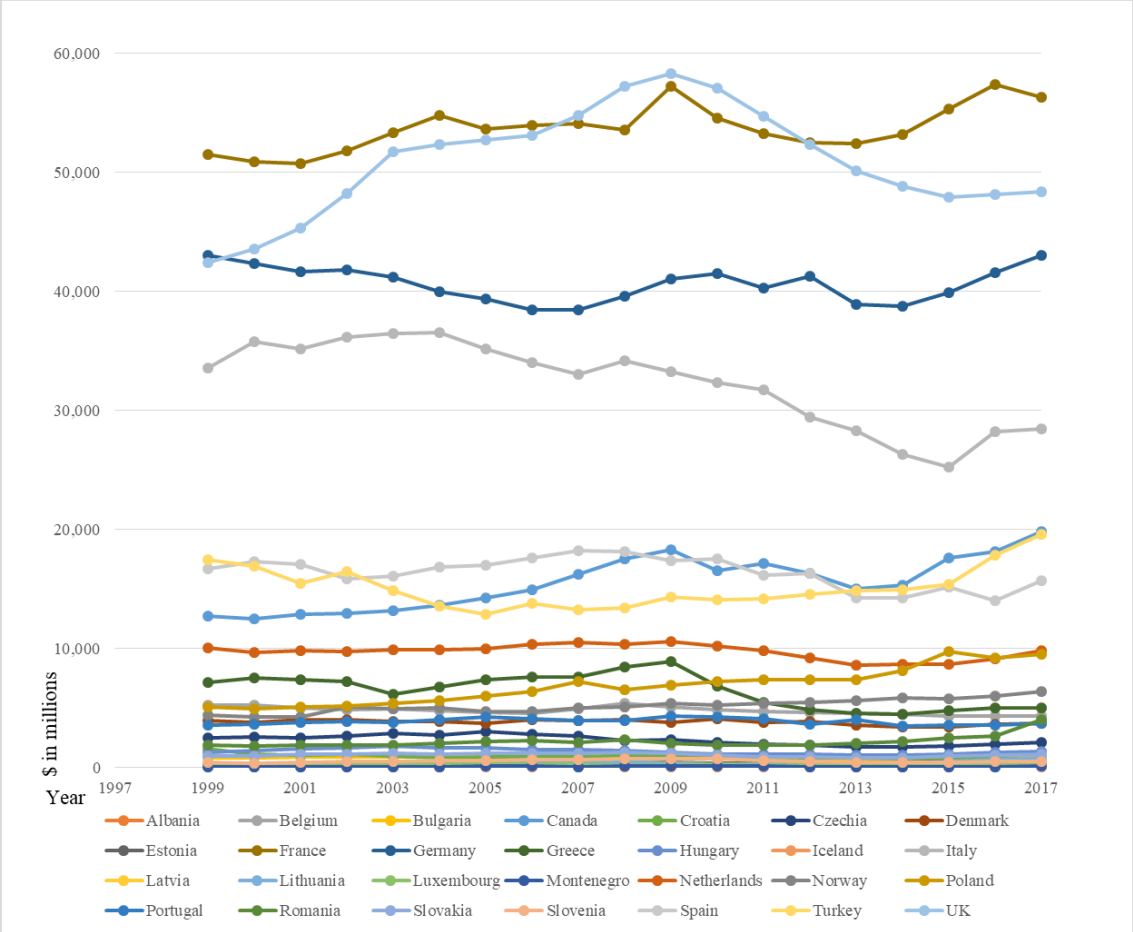
According to the above Table 6, for the year 2017 test, the sample size is 28 countries (N=18); only Iceland remains out of the calculation. The results do not reject the null hypothesis. No correlation was found between the real GDP and percent equipment in 2017. Pearson's Correlation $R_p=0.2454$ is not significant ($p=ns$). The average level of real GDP in 2017 in the sample is \$1,356.7 billion with an SD of \$3,293 billion. The average percent defense expenditure spent on major equipment in 2017 is 18.73 with an SD of 8.57 percent.

3.4 Defense Expenditure Trends from 1999-2017

This section looks at overall trends in NATO's defense expenditure from 1999-2017, as well as looks at NATO's defense expenditure per capita. It then conducts a correlation analysis on the correlation between defense expenditure and the percent defense expenditure spent on major new equipment.

Graph 3 below plots NATO's annual defense expenditure from 1999-2017. The data for defense expenditure in constant 2016 USD can be found in Table 24, as well as data such as the year the NATO member joined is located in Table 22. The graph does not include the USA's defense expenditure due to the USA's large defense expenditure data skewing the graph too greatly.

Graph 3 NATO's Annual Defense Expenditure 1999-2017, excludes the USA (millions USD, years)



Source: own processing, SIPRI (2018a)

As per Graph 3 above and Table 24, 10 countries have had a decrease in their overall defense expenditure since 1999. Croatia has experienced the greatest change in defense expenditure at -53.01 percent, followed by Greece -30.15 percent, Belgium -17.68 percent, Italy -15.26 percent, Czech Republic -14.75 percent, Spain -6.10 percent, Denmark -5.24 percent, Netherlands -2.46 percent, Montenegro -1.61 percent (since 2005), and Germany -0.05 percent. Iceland has had no change, remaining at zero defense expenditure since 1999.

The remaining NATO countries have had a positive increase in 2017 in defense expenditure in comparison with defense expenditures in 1999. Looking again at Graph 3 and Table 24, Latvia has had the greatest percentage increase in defense expenditure at 405.20 percent, followed by Lithuania 284.35 percent, Estonia 280.45 percent, Romania 115.22 percent, Albania 108.43 percent, Poland 87.77 percent, Canada 55.96 percent, Luxembourg 50.13 percent, US 47.51 percent, Norway 45.65 percent, Slovakia 19.00 percent, Slovenia 15.83 percent, UK 14.04 percent, Turkey 12.19 percent, France 9.37 percent, Bulgaria 9.34 percent, Hungary 7.44 percent, and Portugal 3.92 percent.

Of note, NATO's top three defense spenders (US, UK, and France) all have positive percentage increases in defense expenditure since 1999. Other top 10 NATO defense spenders with positive

increases are Turkey, Canada, and Poland. However, not everyone in the top 10 has a positive increase. Germany, Netherlands, Spain, and Italy rank in the top 10 of NATO's defense spenders, but have decreased their defense expenditure since 1999.

Among the NATO's bottom 10 countries in defense spending, all but two countries have positive defense expenditure growth. Montenegro and Croatia have decreased percentage growth, when comparing 1999 and 2017, while the remaining eight countries at the bottom of NATO spenders have positive growth: Bulgaria, Slovenia, Slovakia, Luxembourg, Albania, Lithuania, Latvia, and Estonia. Montenegro became an independent country in 2006.

Ten countries spend less than \$1,000 million annually on defense: Iceland, Montenegro, Albania, Luxembourg, Slovenia, Latvia, Estonia, Croatia, Lithuania, and Bulgaria. Comparing Tables 22 and 24, with the exception of Luxembourg and Iceland, the countries that spend less than \$1,000 million annually on defense all joined NATO since 2004. Since 1999, these countries have never broken the \$1,000 million defense expenditure level.

Iceland has never spent anything on defense. Montenegro, NATO's newest member in 2017, steadily improved its annual defense expenditure before joining NATO, but still entered at 28th place overall in 2017 Defense Expenditure in 2016 constant USD. Montenegro improved from \$60 million spent on defense in 2012 to \$72 million in 2017. Since 1999, Montenegro spent the most on its defense in 2008 at \$74.1 million.

Since 1999, Albania has improved its defense expenditure from \$73 million to \$152 million in 2017 after reaching a pinnacle \$208 million in 2008, but still ranks 27th overall in total defense expenditure. Luxembourg, 27th place overall in defense expenditure in NATO, recently broke into the \$300 million mark, improving its defense expenditure from \$201 million in 1999 to \$310 million in 2017.

Looking again at Table 24, Slovenia also ranks in the bottom third in NATO in defense expenditure at 25th place. Slovenia has increased its defense expenditure from \$400 million in 1999 to \$463 million in 2017 but has not come close again to spending what it spent at its height of \$686 million in 2009.

At 24th is Latvia, a country which increased its defense expenditure from \$97 million in 1999 to \$492 million in 2017. Notably, Latvia almost returned in 2017 to its 2007 spending levels. Latvia's defense expenditure in 2007 was \$496 million, as compared to Latvia's \$492 million in 2017.

Just edging out Latvia for 23rd place is Estonia. Estonia has increased its defense spending almost four-fold, from \$134 million in 1999 to \$509 million in 2017. Estonia reached a high point in 2007 when it spent \$455 million. Its defense spending decreased in 2008 and 2009, but increased each year since 2010.

Ranked 22nd, Croatia is one of two countries in Central Europe, and one of nine countries overall in NATO which has decreased its defense expenditures. Croatia spent the most on defense in 1999, spending \$1,586 million. Croatia steadily decreased its defense spending by almost half reaching a low of \$745 million in 2017.

In the 21st spot in overall defense expenditure, Lithuania has increased its defense spending since 1999 almost four-fold. Lithuania spent \$201 million on defense in 1999 and increased to \$773 million in 2017. From 1999-2008, Lithuania's defense spending increased from \$201 million in 1999 to \$470 million in 2008. From 2009-2011, Lithuania's defense spending decreased. Defense spending rebounded each year starting 2012, increasing from \$286 million in 2012 to \$773 million in 2017.

As per Table 24, in the 20th spot, Bulgaria has only slightly increased its defense expenditure since 1999, increasing from \$771 million in 1999 to \$843 million in 2017. Bulgaria hit its pinnacle of spending in 2007 when its defense expenditure reached \$1,043 million. Since 2007, Bulgaria's defense spending has fluctuated up and down.

Slovakia (19th overall in defense expenditure in NATO), part of NATO's eastward expansion in 2004, has improved its defense spending slightly from \$922 million in 1999 to \$1,098 in 2017. However, after reaching a height of defense spending in 2008 of \$1,228 million, Slovakia has never again surpassed that defense spending level. Slovakia achieved an all-time low in 2013, spending only \$799 million, but has been steadily increasing defense spending each year since.

Hungary ranks 18th overall in defense expenditure in NATO. Since 1999, Hungary has only improved its defense spending slightly from \$1,256 million in 1999 to \$1,350 million in 2017. Hungary has, however, increased its defense spending from its all-time low in 2014 of \$1,002 million to \$1,350 million in 2017. Hungary spent the most on defense in 2003 when it spent \$1,795 million but has never come close to that level since.

Ranked 17th in defense expenditure, Czech Republic is the second NATO country in Central Europe to have decreased its defense expenditure since 1999. Czech Republic spent \$2,464 million on defense in 1999, decreasing to \$2,101 million in 2017. Czech Republic reached its height of defense spending in 2005 when it spent \$2,976 million and has never come close since. Czech Republic's lowest level of defense spending was in 2014, spending \$1,735 million. Since 2014, Czech Republic has improved steadily from \$1,735 million in 2014 to \$2,101 million in 2017.

Portugal, a NATO member since 1949 and ranked 16th overall in defense expenditure, has remained fairly stable in its defense spending since 1999. Portugal increased its defense spending only slightly from 1999 in \$3,524 million to \$3,662 million in 2017. Portugal's highest defense spending years were in 2005 at \$4,215 million, 2009 at \$4,303 million, and 2010 at \$4,243 million. Portugal has never reached those levels since.

Denmark is one of seven NATO countries in Western Europe who has decreased its defense spending since 1999 although the nation still ranks 15th overall in NATO in defense expenditure. Denmark decreased from \$3,905 million in 1999 to \$3,701 million in 2017. Denmark spent the most on defense in 2008 (\$4,036 million) and in 2010 (\$4,040 million). Denmark has, however, increased its defense spending from \$3,370 million in 2015 to \$3,701 million in 2017.

Holding 14th place, Romania has more than doubled its defense spending since 1999 from \$1,847 million to \$3,975 million in 2017 when it reached its pinnacle of defense spending. From 1999-2008, Romania increased its defense spending from \$1,847 million in 1999 to \$2,344 million in 2008. Following 2008, defense spending decreased. Romania has increased its defense spending each year since 2012 to its current level of defense spending.

Belgium is another one of the seven NATO countries in Western Europe who has decreased its defense spending since 1999. Belgium decreased from \$5,211 million in 1999 to \$4,290 million in 2017 when it landed in 13th place overall in defense expenditure. Belgium spent the most on defense in 2008 (\$5,377 million), but has steadily decreased its spending since.

Greece ranks 12th overall in defense expenditure in NATO and is also one of the seven NATO countries in Western Europe who has decreased its defense spending since 1999. Greece has decreased its defense spending from \$7,100 million in 1999 to \$4,959 million in 2017. Greece's top defense spending was from 2008-2009 when it spent \$8,455 million and \$8,865 million

respectively. Since Greece's height of defense spending in 2008/9, Greece has never returned to that level of spending.

Norway, one of the oldest members of NATO and 11th overall in defense spending, has improved its defense spending from \$4,346 million in 1999 to \$6,330 million in 2017. Since 2010, Norway has increased its defense spending fairly steadily from \$5,257 million to \$6,330 million in 2017.

Poland, the only NATO ally in Central Europe breaking the top 10 in defense expenditure, has almost doubled its defense spending since 1999. Poland increased its defense expenditure from \$5,070 million in 1999 to \$9,519 million in 2017. Poland has steadily increased its defense spending each year since 2008.

Although the Netherlands has decreased its defense spending since 1999 (decreasing from \$10,027 million in 1999 to \$9,780 million in 2017), it still holds on to 9th overall in defense expenditure. Netherlands spent the most money on defense from 2006-10, spending over \$10,000 million each year. The country is on a glide path to once again reach the \$10,000 million level of defense spending in the next couple years. Netherlands has increased its defense spending steadily from \$8,573 million in 2013 to \$9,780 million in 2017.

Spain is NATO's 8th highest spender on defense, spending \$15,686 million in 2017. However, Spain is among the Western European countries in NATO which has decreased its spending from 1999. Spain decreased its spending from \$16,706 million in 1999 to \$15,686 million in 2017. Spain's highest levels of defense spending were in 2007 and 2008 when Spain spent \$18,207 million and \$18,107 million respectively. Since 2008, Spain has never reached that level of spending again. However, Spain has increased its defense expenditure from \$14,219 million in 2014 to \$15,686 million in 2017.

Turkey, one of NATO's oldest members and ranked seventh in defense expenditure, has increased its defense spending from \$17,452 million in 1999 to \$19,580 million in 2017. Turkey reached an all-time low in defense spending in 2007 (\$13,252 million), 2008 (\$13,401 million), and 2009 (\$13,340 million). Since then, Turkey has increased its defense expenditures each year with notable increases since 2014. Since 2014, Turkey has increased its defense spending from \$14,942 million in 2014 to \$19,580 million in 2017.

Canada, one of two NATO members in North America and NATO's sixth top spender on defense, has increased its defense spending from \$12,719 million in 1999 to \$19,837 million in 2017. Since 2013, Canada has increased its defense spending each year, increasing from \$15,030 in 2013 to \$19,837 million in 2017.

Italy ranks fifth in defense spending in NATO, but is one of seven countries in Western Europe who has decreased its spending from \$33,533 million in 1999 to \$28,417 million in 2017. Italy reached its pinnacle level of spending in 2008 when it spent \$34,188 million. Since 2008, Italy decreased its spending each year, reaching an all-time low in 2015 (\$25,192 million). Since 2015, Italy has increased its spending to \$28,417 million in 2017.

Although Germany ranks fourth overall in defense expenditure in NATO, Germany has decreased its defense spending slightly from \$43,045 in 1999 to \$43,023 in 2017. Notably, Germany's top year for defense spending was in 1999, a level the country has never reached again, but came close in 2017.

The United Kingdom ranks third overall in defense spending and has increased its spending from \$42,426 million in 1999 to \$48,383 million in 2017. However, the UK reached its top level of defense expenditure in 2009 at \$58,315 million decreased each year to approximately \$48,000 million in 2014 and has remained approximately at that level.

France spends the second most on defense in NATO and has increased its defense spending from \$51,466 million in 1999 to its highest recorded defense expenditure of \$56,287 million in 2017. France has maintained its high level of defense spending each year between 1999 and 2017, maintain a spending level between \$50,873 million and \$56,287 million.

The United States spends by far the most on defense in NATO. The US has increased its defense spending from \$404,830 million in 1999 to \$597,178 million in 2017. The US spent the most on defense in 2010 when it spent \$768,466 million, but has decreased each year since.

Overall, nine countries in NATO decreased their defense expenditure from 1999 to 2017: Croatia, Germany, Italy, Spain, Netherlands, Greece, Belgium, Denmark, and Czech Republic. These countries are mainly Western European countries and the oldest members of NATO. Sixteen NATO members' defense expenditures hit a pinnacle around 2008/9 and decreased the years directly following: Albania, Montenegro, Slovenia, Latvia, Estonia, Lithuania, Bulgaria, Slovakia, Portugal, Denmark, Romania, Belgium, Greece, Spain, Canada, United Kingdom, and the United States. The following countries' defense spending began to rebound early- to mid-2010s following their 2008-09 highs: Montenegro (2013), Slovenia (2015), Latvia (2012), Estonia (2010), Lithuania (2012), Bulgaria (2015), Slovakia (2013), Portugal (2014), Denmark (2015), Romania (2012), Belgium (2015), Greece (2014), and Canada (2013).

This suggests that the economic crisis in 2008 directly affected NATO members' defense spending.

3.4.1 Defense Expenditure per Capita Trend in NATO

Looking at 2017 data in Table 28, each NATO member's defense expenditure per capita rank in NATO typically remains approximately the same (within 1-4 ranks) as its GDP per capita rank in NATO. There are several notable exceptions. Slovenia ranks 19th overall in NATO in defense expenditure per capita, spending \$251 per person. Slovenia increases to rank 14th overall in GDP per capita at \$25,600.

Poland, for example, ranks 14th in NATO in defense expenditure per capita, spending \$309 per person. Yet, Poland falls to rank 23rd in NATO with GDP per capita at \$15,500.

Estonia ranks 12th overall in defense expenditure per capita in NATO, spending \$393 per person. Estonia, however, ranks much lower in 19th place in GDP per capita at \$18,800. Luxembourg is also another exception. Luxembourg spends \$500 on defense expenditure per capita, ranking 10th overall in NATO. Yet, Luxembourg ranks first overall in NATO in GDP per capita at \$108,800.

Greece ranks towards the top in NATO at 9th place, spending \$545 in defense expenditure per capita. Yet, Greece falls to 15th place overall in GDP per capita at \$23,100. France likewise ranks fourth overall in defense expenditure per capita at \$760, but falls to 10th overall in GDP per capita at \$426,000. The UK has a similar but slightly worse drop. The UK ranks third overall in NATO in defense expenditure per capita at \$896, but falls to 11th overall in GDP per capita at \$42,300.

A NATO member's defense expenditure per capita rank is reflective of its overall GDP per capita rank in NATO. There are seven total exceptions to this rule and all but one country ranks higher on defense expenditure per capita and then falls in its overall GDP per capita rank. Slovenia is the only country that doesn't fit the exception's pattern.

3.4.2 Correlation between Defense Expenditure and Equivalent of Percent GDP spent on Defense

In order to test the correlation between defense expenditure and equivalent of percent GDP spent on defense, a Pearson correlation is run using JMP Pro 13 software because both variables are continuous variables. This correlational test is conducted three times: 2000 (pre-9/11), 2009, and 2017. All data used for these three correlational tests can be found in Table 24 and 25.

The null hypothesis H0 is the variables (defense expenditure and equivalent of percent GDP) are independent. There is no correlation between the two variables. The H1 hypothesis is the variables are dependent. There is a positive correlation between defense expenditure and equivalent of percent GDP spent on defense, defense expenditure increases, equivalent of percent GDP spent on defense increases.

Table 7 Pearson Correlation: Defense Expenditure and Equivalent of Percent GDP spent on Defense in 2000

Pairwise Correlations							
Variable	by Variable	Correlation	Count	Lower 95 %	Upper 95 %	Signif Prob	
%GDP 2000	DefExp 2000	0.2376	18	-0.2579	0.6341	0.3424	
Univariate Simple Statistics							
Column	N	DF	Mean	Std Dev	Sum	Min	Max
DefExp 2000	27	26	25,493.3	80,342.1	688,320	80.4	420,496
%GDP 2000	18	17	2.0889	1.0346	37.6	0.7	4.9

Source: own processing, SIPRI (2018a), NATO (2018a), NATO (1999) and NATO (2010)

As displayed in Table 7 above, for the first test in 2000, the sample size is 18 NATO countries; Montenegro was not yet a country, Iceland has no military and zero defense expenditure, and 10 other countries were not yet NATO members (Albania, Bulgaria, Croatia, Estonia, Latvia, Lithuania, Montenegro, Romania, Slovakia, and Slovenia). The results do not reject the null hypothesis. In a sample of 18 countries (N=18), no correlation was found between the defense expenditure in 2000 and equivalent of percent GDP spent on defense in 2000. Pearson's Correlation $R_p(17)=0.2376$, $p=ns$. The average level of defense expenditure in 2000 in the sample is \$25,493.3 million with an SD of \$80,342.1 million. The average equivalent of percent GDP spent on defense is 2.09 percent with a SD of 1.03 percent.

Table 8 Pearson Correlation: Defense Expenditure and Equivalent of Percent GDP spent on Defense in 2009

Pairwise Correlations							
Variable	by Variable	Correlation	Count	Lower 95 %	Upper 95 %	Signif Prob	
%GDP 2009	DefExp 2009	0.6725	27	0.3929	0.8383	0.0001	
Univariate Simple Statistics							
Column	N	DF	Mean	Std Dev	Sum	Min	Max
DefExp 2009	28	27	37,260.7	140,262	1,043,300	68	747,940
%GDP 2009	27	26	1.6704	0.6574	45.10	0.5	3.8

Source: own processing, SIPRI (2018a), NATO (2018a), NATO (1999) and NATO (2010)

For the 2009 test shown in Table 8 above, the sample size is 27 countries; Iceland remains out of the calculation and Montenegro did not join NATO until 2017. The results reject the null hypothesis (H_0) and reveal a positive, strong significant correlation between the variables $R_p(26) = 0.6725$, $p < 0.001$, showing that in NATO as defense expenditure increases, equivalent of percent GDP spent on defense increases. The significant correlation indicates the probability is low that the correlation between defense expenditure and percent major equipment is random. The average defense expenditure in 2009 in the sample is \$37,261.7 million with a SD of \$140,262 million. The average equivalent of percent GDP spent on defense is 1.67 percent with an SD of 0.66 percent.

Table 9 Pearson Correlation: Defense Expenditure and Equivalent of Percent GDP spent on Defense in 2017

Pairwise Correlations							
Variable	by Variable	Correlation	Count	Lower 95 %	Upper 95 %	Signif Prob	
%GDP 2017	DefExp 2017	0.7004	28	0.4431	0.8411	<0.0001	
Univariate Simple Statistics							
Column	N	DF	Mean	Std Dev	Sum	Min	Max
DefExp 2017	28	27	31,554.1	111,929	883,515	71.70	597,178
%GDP 2017	28	27	1.4857	0.5954	41.60	0.460	3.5700

Source: own processing, SIPRI (2018a), NATO (2018a), NATO (1999) and NATO (2010)

For the 2017 test presented in Table 9 above, only Iceland remains out of the calculations. The results reject the null hypothesis (H_0) and reveal a positive, strong significant correlation between the variables $R_p(27) = 0.7004$, $p < 0.001$, showing that in NATO as defense expenditure increases, equivalent of percent GDP spent on defense increases. The significant correlation indicates the probability is low that the correlation between defense expenditure and percent major equipment is random. The average defense expenditure in 2017 in the sample is \$31,554.1 million with a SD of \$111,929 million. The average equivalent of percent GDP spent on defense is 1.49 percent with an SD of 0.60 percent.

3.4.3 Correlation between Real GDP and equivalent of percent GDP spent on defense

In order to test the correlation between real GDP and defense expenditure as equivalent of percent GDP, a Pearson correlation was run in JMP Pro 13 software because both variables are continuous variables. This correlational test was conducted three times: 2000 (pre-9/11), 2009, and 2017. All data for the below correlation calculations were gathered from Table 23 and 26.

The null hypothesis H0 is the variables (real GDP and percent GDP) are independent. There is no correlation between the two variables. The H1 hypothesis is the variables are dependent. There is a positive correlation between real GDP and equivalent of percent GDP spent on defense, as real GDP increases, equivalent of percent GDP spent on defense increases.

Table 10 Pearson Correlation: Real GDP and equivalent of percent GDP Spent on Defense in 2000

Pairwise Correlations							
Variable	by Variable	Correlation	Count	Lower 95 %	Upper 95 %	Signif Prob	
%GDP 2000	R-GDP 2000	0.1855	18	-0.3080	0.6004	0.4611	
Univariate Simple Statistics							
Column	N	DF	Mean	Std Dev	Sum	Min	Max
R-GDP 2000	28	27	1,021.57	2,441.06	28,604.0	3.00	12,713.0
%GDP 2000	18	17	2.0889	1.0346	37.60	0.70	4.90

Source: own processing, The World Bank (2018), NATO (2018a), NATO (1999) and NATO (2010)

Table 10 above displays for the first test in 2000, the sample size is 18 NATO countries; Montenegro was not yet a country, Iceland has no military and zero defense expenditure, and 10 other countries were not yet NATO members (Albania, Bulgaria, Croatia, Estonia, Latvia, Lithuania, Montenegro, Romania, Slovakia, and Slovenia).

The results do not reject the null hypothesis. In a sample of 18 countries (N=18), no correlation was found between the real GDP and equivalent of percent GDP spent on defense in 2000. The Pearson's Correlation is $R_p(18) = 0.1855$, p =not significant (ns). The average level of real GDP in 2000 in the sample is \$1,021.6 billion with an SD of \$2,441.1 billion. The average equivalent of percent of GDP spent on defense is 2.09 with an SD of 1.03 percent.

The year 2000 correlational tests do not have the same sample size as following two tests (years 2007 and 2017) because 12 countries were missing data on account of not being NATO members or having no military (Iceland). This could be the reason why these not significant results do not match the pattern of the following two correlational tests.

Table 11 Pearson Correlation: Real GDP and equivalent of percent GDP Spent on Defense in 2009

Pairwise Correlations							
Variable	by Variable	Correlation	Count	Lower 95 %	Upper 95 %	Signif Prob	
%GDP 2009	R-GDP 2009	0.6494	27	0.3577	0.8257	0.0002	
Univariate Simple Statistics							
Column	N	DF	Mean	Std Dev	Sum	Min	Max
R-GDP 2009	28	27	1,165.11	2,784.25	32,623.0	4.00	14,595.0
%GDP 2009	27	26	1.6704	0.6574	45.10	0.50	3.80

Source: own processing, The World Bank (2018), NATO (2018a), NATO (1999) and NATO (2010)

Presented in Table 11 above, for the 2009 test, the sample size is 27 countries; Iceland remains out of the calculation and Montenegro did not join NATO until 2017. The results reject the null hypothesis (H_0) and reveal a positive, strong significant correlation between the variables $R_p(27) = 0.6494$, $p < 0.001$, showing that in NATO as real GDP increases, equivalent of percent GDP increases. The significant correlation indicates the probability is low that the correlation between defense expenditure and real GDP is random. The average real GDP in 2009 is \$1,165.1 billion with an SD of \$2,784.3 billion. The average equivalent of percent of GDP spent on defense in 2009 is 1.67 with an SD of 0.66 percent.

Table 12 Pearson Correlation: Real GDP and equivalent of percent GDP Spent on Defense in 2017

Pairwise Correlations							
Variable	by Variable	Correlation	Count	Lower 95 %	Upper 95 %	Signif Prob	
%GDP 2017	R-GDP 2017	0.6681	28	0.3930	0.8335	0.0001	
Univariate Simple Statistics							
Column	N	DF	Mean	Std Dev	Sum	Min	Max
R-GDP 2017	28	27	356.71	3,292.95	37,988.0	5.00	17,305.0
%GDP 2017	28	27	1.4857	0.5954	41.60	0.460	3.57

Source: own processing, The World Bank (2018), NATO (2018a), NATO (1999) and NATO (2010)

For the year 2017 test exhibited in Table 12 above, the sample size is 28 countries; only Iceland remains out of the calculation. The results also reject the null hypothesis (H_0) and reveal a positive, strong significant correlation between the variables $R_p(28) = 0.6681$, $p < 0.001$ and indicates as real GDP increases, equivalent of percent GDP spent on defense expenditure increases. The significant correlation indicates the probability is low that the correlation between real GDP and equivalent of percent GDP spent on defense is random. The average real GDP in 2017 is \$356.7 billion with an SD of \$3,293 billion. The average level equivalent of percent of GDP spent on defense in 2017 is 1.49 with an SD of 0.59 percent.

3.4.4 Correlation between Defense Expenditure and Percent Defense Expenditures spent on Major New Equipment

In order to test the correlation between defense expenditure and percent defense expenditure spent on major new equipment, a Pearson correlation is run using JMP Pro 13 software because both variables are continuous variables. This correlational test is conducted three times: 2000 (pre-9/11), 2009, and 2017. All data used for these three correlational tests can be found in Tables 24 and 27.

The null hypothesis H0 is the variables (defense expenditure and percent Major Equipment) are independent. There is no correlation between the two variables. The H1 hypothesis is the variables are dependent. There is a positive correlation between defense expenditure and percent major equipment, as defense expenditure increases, percent major equipment increases.

Table 13 Pearson Correlation: Defense Expenditure and Percent Defense Expenditure Spent on Equipment in 2000

Pairwise Correlations							
Variable	by Variable	Correlation	Count	Lower 95 %	Upper 95 %	Signif Prob	
%Equip 2000	DefExp 2000	0.3001	18	-0.1939	0.6727	0.2263	
Univariate Simple Statistics							
Column	N	DF	Mean	Std Dev	Sum	Min	Max
DefExp 2000	27	26	25,493.3	80,342.1	68,8320	80.40	420,496
%Equip 2000	18	17	15.4111	6.7061	277.400	4.60	28.30

Source: own processing, SIPRI (2018a), NATO (2018a), NATO (1999) and NATO (2010)

As shown in Table 13 above, for the first test in 2000, the sample size is 18 NATO countries; Montenegro was not yet a country, Iceland has no military and zero defense expenditure, and 10 other countries were not yet NATO members (Albania, Bulgaria, Croatia, Estonia, Latvia, Lithuania, Montenegro, Romania, Slovakia, and Slovenia). The results do not reject the null hypothesis. In a sample of 18 countries (N=18), no correlation was found between the defense expenditure in 2000 and percent defense expenditure spent on major new equipment in 2000. Pearson's Correlation $R_p(17)=0.3$, $p=ns$. The average level of defense expenditure in 2000 in the sample is \$25,493.3 million with an SD of \$80,342.1 million. The average percent equipment is 15.4 percent with a SD of 6.71 percent.

Table 14 Pearson Correlation: Defense Expenditure and Percent Defense Expenditure Spent on Equipment in 2009

Pairwise Correlations							
Variable	by Variable	Correlation	Count	Lower 95 %	Upper 95 %	Signif Prob	
%Equip 2009	DefExp 2009	0.4299	27	0.0596	0.6962	0.0252	
Univariate Simple Statistics							
Column	N	DF	Mean	Std Dev	Sum	Min	Max
DefExp 2009	28	27	37,260.7	140,262	1,043,300	68.00	747,940
%Equip 2009	27	26	16.6704	6.8210	450.10	5.40	30.00

Source: own processing, SIPRI (2018a), NATO (2018a), NATO (1999) and NATO (2010)

Table 14 above indicates that for the 2009 test, the sample size is 27 countries; Iceland remains out of the calculation and Montenegro did not join NATO until 2017. The results reject the null hypothesis (H_0) and reveal a positive, medium strength significant correlation between the variables $R_p(26) = 0.4299$, $p < 0.05$, showing that in NATO as defense expenditure increases, percent major equipment increases. The significant correlation indicates the probability is low that the correlation between defense expenditure and percent major equipment is random. The average defense expenditure in 2009 in the sample is \$37,260.7 million with a SD of \$140,262 million. The average percent equipment is 16.67 percent with a SD of 6.82 percent.

Table 15 Pearson Correlation: Defense Expenditure and Percent Defense Expenditure Spent on Equipment in 2017

Pairwise Correlations							
Variable	by Variable	Correlation	Count	Lower 95 %	Upper 95 %	Signif Prob	
%Equip 2017	DefExp 2017	0.2442	28	-0.1418	0.5658	0.2104	
Univariate Simple Statistics							
Column	N	DF	Mean	Std Dev	Sum	Min	Max
DefExp 2017	28	27	31,544.1	111,929	883,515	71.70	597,178
%Equip 2017	18	27	18.7318	8.5746	524.49	4.010	33.20

Source: own processing, SIPRI (2018a), NATO (2018a), NATO (1999) and NATO (2010)

For the 2017 test (see Table 15 above), only Iceland remains out of the calculations. The results do not reject the null hypothesis. In a sample of 28 countries ($N=28$), no correlation was found between the defense expenditure in 2017 and percent defense expenditure spent on major new equipment in 2017. Pearson's Correlation $R_p(27)=0.2442$, $p=ns$. The average level of defense expenditure in 2017 in the sample is \$31,554.1 million with a SD of \$111,929. The average percent equipment is 18.73 percent with a SD of 8.57 percent.

3.5 Impacts on NATO's Defense Spending

This section looks at some factors which may affect NATO's members defense spending. It looks both at geographical size and population size, attempting to find correlations and noting important impacts of geographical size and population on meeting NATO's goals. This section also addresses geo-political concerns on NATO's eastern flank, as well as the ramifications of 9/11 and terrorism.

3.5.1 Geographical Impacts on NATO's Defense Spending

This section examines the impact of geographical size and landlocked status on meeting NATO's goals, as well as tests if there is a correlation between geographical size and defense expenditure. All data used in this section can be found in Tables 22, 24 and 26.

To examine the impact of geographical size, the two largest countries in NATO (Canada and the USA) will be examined, which also happen to not be on the European Continent, as well as the next five largest countries according to Table 22 (Turkey, France, Spain, Germany, and Norway), since these five are on the European continent. Comparing Table 22 to Table 24, all seven of the countries are in the top 11 of 29 in defense expenditures in 2017. Canada is the largest country geographically in NATO and the sixth largest in defense expenditure in NATO at \$19,837 million. The USA is the second largest country geographically in NATO, but is by far the top in defense expenditure at \$597,178 million.

According to Table 22, on the European continent, the largest geographically sized country is Turkey who ranks seventh in NATO in defense expenditure, spending \$19,580 million. France is the second largest country geographically in NATO on the European continent, but ranks second overall in NATO in defense expenditure at \$56,287 million according to Table 24. Comparing Tables 22 and 24, the three remaining top five largest European countries geographically in NATO rank spend: Spain (8th largest defense expenditure at \$15,686 million), Germany (4th largest defense expenditure at \$43,023 million), and Norway (11th largest defense expenditure at \$6,330 million).

Comparing data from Tables 22 and 26, in 2017, except for the USA, the top five largest NATO's countries in geographical size do not spend equivalent of 2 percent of GDP on defense: (1) Canada 1.29 percent; (2) USA 3.57 percent; (3) Turkey 1.48 percent; (4) France 1.79 percent; (5) Spain 0.92 percent. However, all five countries either meet the 20 percent equipment goal or come within less than a percent of meeting the goal: (2) Canada 19.42 percent; (2) USA 28.43 percent; (3) Turkey 30.4 percent; (4) France 24.17 percent; and (5) Spain 19.31 percent. Of note, NATO's sixth largest country in geographical size, Germany, meets neither the equivalent of 2 percent GDP (1.24 percent in 2017) spent on defense nor the 20 percent of defense expenditure spent on major defense equipment (13.75 percent in 2017) goals.

As listed in Table 22, the landlocked countries of NATO are Czech Republic, Hungary, Luxembourg, and Slovakia. Looking at Table 24, all four countries rank in the bottom half of defense expenditures for NATO: Czech Republic \$2,101 million at rank 17; Hungary \$1,350 million at rank 18, Luxembourg \$310 million at rank 26, and Slovakia \$1,098 million at rank 19. As per Table 26, the four landlocked countries do not meet the equivalent of 2 percent GDP goal in 2017: Czech Republic 1.05 percent; Hungary 1.06 percent, Luxembourg 0.46 percent, and Slovakia 1.19 percent. However, looking at Table 27, two landlocked countries did meet the 20 percent equipment goal: Luxembourg 32.99 percent and Slovakia 20.42 percent, while the other two countries fell far short: Czech Republic 11.12 percent and Hungary 15.34 percent.

In order to test the correlation between geographical size and defense expenditure, a Pearson correlation was run in JMP Pro 13 software because both variables are continuous variables. This correlational test was conducted three times: 2000, 2009, and 2017. For the first test in 2000, only 27 NATO countries are tested; Montenegro was not yet a country in 2000 and Iceland has no military and zero defense expenditure. For the 2009 and 2017 calculation, Montenegro is included, only Iceland remains out of the calculations. The data for all correlational tests was gathered from Tables 22 and 24.

The null hypothesis H0 is the variables (geographical size and defense expenditure) are independent. There is no correlation between the two variables. The H1 hypothesis is the variables are dependent. There is a positive correlation between geographical size and defense expenditure or, as geographical size increases, defense expenditure increases.

Table 16 Pearson Correlation: Geographical Size and Defense Expenditure in 2000

Pairwise Correlations							
Variable	by Variable	Correlation	Count	Lower 95 %	Upper 95 %	Signif Prob	
DefExp 2000	Geo Size	0.6867	27	0.4149	0.8459	<0.0001	
Univariate Simple Statistics							
Column	N	DF	Mean	Std Dev	Sum	Min	Max
Geo Size	28	27.00	874,854	2,559,350	2.45e+7	2,586.0	9,984,670
DefExp 2000	27	26.00	25,493.3	80,342.1	688,320	80.40	420,496

Source: own processing, CIA (2018) and SIPRI (2018a)

For the year 2000 test (see Table 16 above), the results reject the null hypothesis (H0) and reveal a positive, strong significant correlation between the variables $R_p(26) = 0.6867$, $p < 0.001$. Therefore, as geographical size, defense expenditure increases. The significant correlation indicates the probability is low that the correlation between geographical size and defense expenditure is random. The average geographical size is 874,854 square kilometers with an SD of 2,559,350 square kilometers. The average defense expenditure in 2000 in the sample is \$25,493.3 million with an SD of 80,342.1.

Table 17 Pearson Correlation: Geographical Size and Defense Expenditure in 2009

Pairwise Correlations							
Variable	by Variable	Correlation	Count	Lower 95 %	Upper 95 %	Signif Prob	
DefExp 2009	Geo Size	0.6941	28	0.4333	0.8477	<0.0001	
Univariate Simple Statistics							
Column	N	DF	Mean	Std Dev	Sum	Min	Max
Geo Size	28	27.00	874,854	2,559,350	2.45e+7	2,586.0	9,984,670
DefExp 2000	28	27.00	37,260.7	140,262	1043,300	68.00	747,940

Source: own processing, CIA (2018) and SIPRI (2018a)

According to Table 17, for the year 2009, the sample size is 28 countries (N=28). The results reject the null hypothesis (H0) and reveal a positive, strong significant correlation between the

variables $R_p(27) = 0.6941$, $p < 0.0001$, showing that in NATO as geographical size increases, defense expenditure increases. The significant correlation indicates the probability is low that the correlation between geographical size and defense expenditure is random. The average geographical size is 874,854 square kilometers with an SD of 2,559,350 square kilometers. The average level of defense expenditure in 2009 in the sample is \$37,260.7 million with an SD of \$140,262 million.

Table 18 Pearson Correlation: Geographical Size and Defense Expenditure in 2017

Pairwise Correlations							
Variable	by Variable	Correlation	Count	Lower 95 %	Upper 95 %	Signif Prob	
DefExp 2017	Geo Size	0.6983	28	0.4398	0.8499	<0.0001	
Univariate Simple Statistics							
Column	N	DF	Mean	Std Dev	Sum	Min	Max
Geo Size	28	27.00	874,854	2,559,350	2.45e+7	2,586.0	9,984,670
DefExp 2017	28	27.00	31,554.1	111,929	883,515	71.70	597,178

Source: own processing, CIA (2018) and SIPRI (2018a)

For the year 2017 test shown in Table 18, the sample size is 28 countries (N=28). The results reject the null hypothesis (H0) and reveal a positive, strong significant correlation between the variables $R_p(27) = 0.6983$, $p < 0.0001$ and as geographical size increases, defense expenditure increases. The significant correlation indicates the probability is low that the correlation between geographical size and defense expenditure is random. The average geographical size is 874,854 square kilometers with an SD of 2,559,350 square kilometers. The average level of defense expenditure in 2017 in the sample is \$31,554.1 million with an SD of \$111,929 million.

3.5.2 Impact of Population Size on NATO's Defense Expenditure

As per Table 22, NATO's top five largest populations are the USA, Turkey, Germany, France, and the UK. Comparing Table 22 with Tables 3 and 5, except for the USA and the UK, NATO's largest populations did not meet the equivalent of 2 percent GDP spent on defense goal in 2017. Turkey, NATO's second most populous country, spends only 1.48 percent of its GDP on defense, yet does rank 7th overall in NATO defense expenditure. Germany, NATO's third most populous country spends a lowly equivalent of 1.24 percent of its GDP on defense, but does rank fourth overall in defense expenditure in NATO. France is NATO's fourth most populous NATO country, spends equivalent of 1.79 percent of its GDP on defense and ranks second overall in defense expenditure. On the European continent, Italy is NATO's fifth largest population, but spends only equivalent of 1.12 percent of its GDP on defense to protect its people yet ranks fifth overall in defense expenditure. According to Table 27, all of NATO's top six most populous countries (USA, Turkey, Germany, France, UK, and Italy) meet the 20 percent equipment goal except for Germany at 13.75 percent.

In order to test the correlation between population size and defense expenditure, a Pearson correlation was run in JMP Pro 13 software because both variables are continuous variables. This correlational test was conducted three times: 2000, 2009, and 2017. For the first test in 2000, only 27 NATO countries are tested; Montenegro was not yet a country in 2000 and Iceland has no military and zero defense expenditure. For the 2009 and 2017 calculation,

Montenegro is included, only Iceland remains out of the calculations. All data for these correlational tests can be found in Tables 22 and 24.

The null hypothesis H0 is the variables (population size and defense expenditure) are independent. There is no correlation between the two variables. The H1 hypothesis is the variables are dependent. There is a positive correlation between population size and defense expenditure, as population size increases, defense expenditure increases.

Table 19 Pearson Correlation: Population Size 2017 and Defense Expenditure in 2000

Pairwise Correlations							
Variable	by Variable		Correlation	Count	Lower 95 %	Upper 95 %	Signif Prob
DefExp 2000	Population 2017		0.9626	27	0.9185	0.9830	<0.0001
Univariate Simple Statistics							
Column	N	DF	Mean	Std Dev	Sum	Min	Max
Population 2017	28	27	3.35e+7	6.31e+7	9.38e+8	594,130	3.27e+8
DefExp 2000	27	26	25,493.3	80,342.1	688,320	80.40	420,496

Source: own processing, CIA (2018) and SIPRI (2018a)

According to Table 19 above, for the year 2000, the results reject the null hypothesis (H0) and reveal a positive, strong significant correlation between the variables $R_p(26) = 0.9626$, $p < 0.0001$. Therefore, as population size increases, defense expenditure increases. The significant correlation indicates the probability is low that the correlation between population size and defense expenditure is random. The average population size is 33,500,000 with an SD of 63,100,000. The average level of defense expenditure in 2000 in the sample is \$25,493.3 million with an SD of \$80,342.1 million.

Table 20 Pearson Correlation: Population Size in 2017 and Defense Expenditure in 2009

Pairwise Correlations							
Variable	by Variable		Correlation	Count	Lower 95 %	Upper 95 %	Signif Prob
DefExp 2009	Population 2017		0.9446	28	0.8825	0.9743	<0.0001
Univariate Simple Statistics							
Column	N	DF	Mean	Std Dev	Sum	Min	Max
Population 2017	28	27	3.35e+7	6.31e+7	9.38e+8	594,130	3.27e+8
DefExp 2000	28	27	37,260.7	140,262	1043,300	68.00	747,940

Source: own processing, CIA (2018) and SIPRI (2018a)

Table 20 above indicates for the year 2009, the sample size is 28 countries (N=28). The results reject the null hypothesis (H0) and reveal a positive, strong significant correlation between the variables $R_p(27) = 0.9446$, $p < 0.0001$, showing again that in NATO as population size increases, defense expenditure increases. The significant correlation indicates the probability is low that the correlation between population size and defense expenditure is random. The average population size is 33 500,000 with an SD of 63,100,000. The average level of defense expenditure in 2009 in the sample is \$37,260.7 million with an SD of \$140,262 million.

Table 21 Pearson Correlation: Population Size and Defense Expenditure in 2017

Pairwise Correlations							
Variable	by Variable	Correlation	Count	Lower 95 %	Upper 95 %	Signif Prob	
DefExp 2017	Population 2017	0.9516	28	0.8971	0.9776	<0.0001	
Univariate Simple Statistics							
Column	N	DF	Mean	Std Dev	Sum	Min	Max
Population 2017	28	27	3.35e+7	6.31e+7	9.38e+8	594,130	3.27e+8
DefExp 2017	28	27	31,554.1	111,929	883,515	71.70	597,187

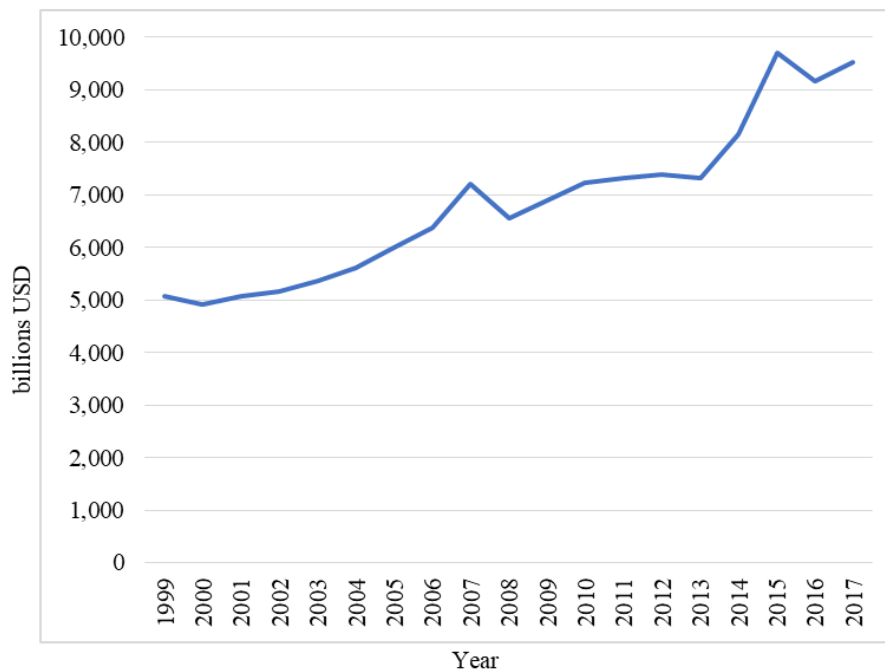
Source: own processing, CIA (2018) and SIPRI (2018a)

Table 21 displays above that for the year 2017, the sample size is 28 countries (N=28). The results reject the null hypothesis (H0) and reveal a positive, strong significant correlation between the variables $r(28) = 0.9516$, $p < 0.0001$ and population size increases, defense expenditure increases. The significant correlation indicates the probability is low that the correlation between population size and defense expenditure is random. The average population size is 33,500,000 with an SD of 63,100,000. The average level of defense expenditure in 2017 in the sample is \$31,554.1 million with an SD of \$111,929 million.

3.5.3 NATO's Eastern Flank

Of NATO's eastern flank (Bulgaria, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, and Slovenia), Poland sets itself apart from the other eight countries, spending far more on defense expenditure and meeting NATO's goals.

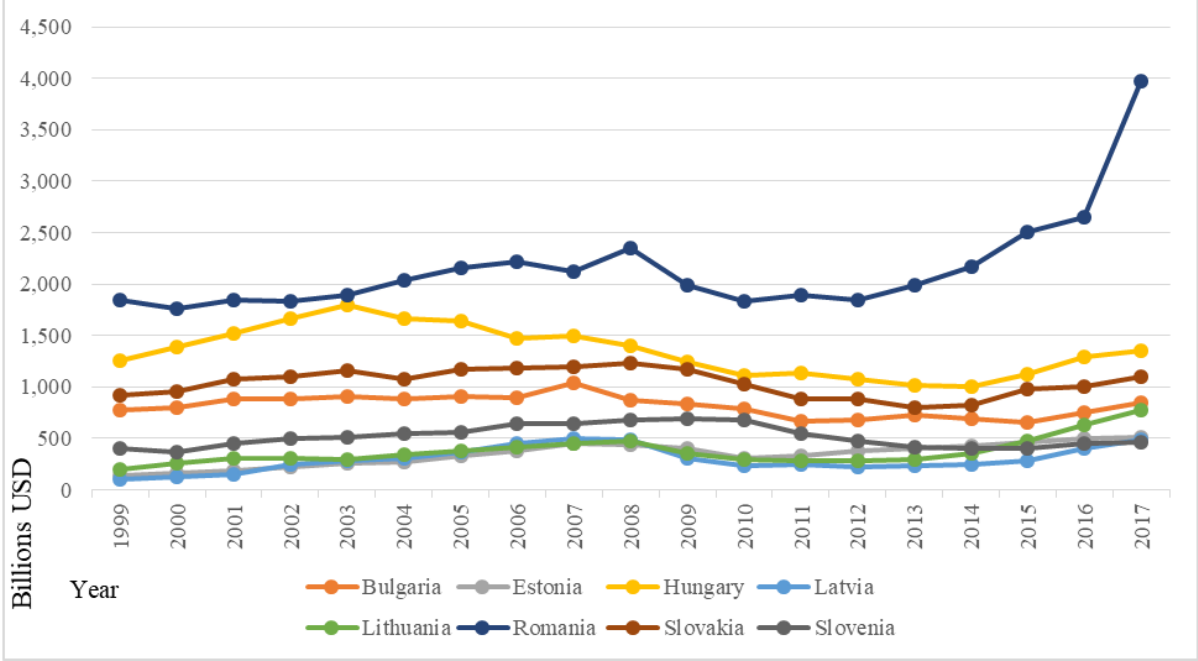
Graph 4 Poland's Defense Expenditure in years 1999-2017 (billions USD, years)



Source: own processing, NATO (2018a)

Poland is graphed alone in Graph 4 because it spends so much more than the other eastern flank countries as seen in Table 24, that it greatly skews the graph.

Graph 5 NATO’s Eastern Flank – Defense Expenditure 1999-2017, Poland Excluded (billions USD, years)



Source: own processing, NATO (2018a)

As per Graph 5 and Table 24, with the exception of Poland, which clearly has an upward trend in its defense expenditure, the other eight countries on NATO's eastern flank also have a slight increase in defense expenditure since 2011, most notably starting in 2015 coinciding with the perception of an increased Russian threat.

Poland ranks 10th overall in NATO in defense expenditure, spending \$9,780 million. Poland has steadily increased its defense expenditure, almost doubling its defense expenditure since 1999 (\$5,070 million). Most notably, Poland has increased its defense expenditure from \$7,327 million in 2013 to \$9,519 in 2017. Further comparing data from Tables 26, 27 and Graphs 6 and 7, Poland meets both NATO goals from the Warsaw summit; in 2017, Poland spent equivalent of 1.99 percent of its GDP on defense and spent 22.14 percent of its defense budget on major equipment.

Looking again at Tables 24, 26, and 27, Romania also ranks in the top half of NATO members' defense expenditures, spending \$3,975 million in 2017. Romania comes close to meeting the equivalent of two percent GDP on defense goal, reaching 1.8 percent in 2017 and also spends 33.2 percent of its defense expenditure on major equipment. Since Russia began seriously implementing its strategy of malign influence and after the 2014 Russian incursion into Crimea, Romania has significantly increased its defense expenditure. Romania has more than doubled its defense expenditure since 2012. In 2012, Romania's defense expenditure was \$1,847 million. By 2017, Romania reached \$3,975 million.

Looking at Table 24, the remaining seven countries on NATO's eastern flank rank in the bottom half of defense expenditures in NATO, all falling within range of 18th-25th in NATO. The Baltic States – Estonia, Latvia, and Lithuania – have made great strides in increasing their defense expenditure, equivalent of percent GDP spent on defense, and percent defense spent on major equipment. Estonia ranks 23rd in NATO for defense expenditure but meets the

equivalent of two percent GDP goal and almost meets the 20 percent equipment goal as per Tables 26 and 27.

Once again comparing data in Tables 24, 26 and 27, Latvia ranks 24th in NATO for defense expenditure and has made great strides towards meeting the equivalent of two percent GDP and 20 percent equipment goals. Latvia has increased its equivalent of percent GDP spent on defense from 0.93 percent in 2014 to 1.75 percent in 2017. Latvia increased its percent defense expenditure spent on major equipment from 7.39 percent in 2013 to 17.22 percent in 2017.

Lithuania ranks 21st in NATO for defense expenditure at \$773 million in 2017. Similar to its fellow Baltic States, Lithuania has also made great strides toward meeting its NATO commitments. Lithuania improved its equivalent of percent GDP spent on defense from 0.76 percent in 2013 to 1.73 percent in 2017. Lithuania also improved its percent defense expenditure spent on major equipment from 9.23 percent in 2013 to 31.09 percent in 2017.

Hungary ranks 18th in NATO for defense expenditure at \$1,350 million in 2017 as per Table 24. While Hungary's defense expenditure has increased from \$1,002 million in 2014 to \$1,350 million in 2017, Hungary's equivalent of percent GDP spent on defense has remained relatively static at 1.06 percent as shown in Table 26 and Graph 4. Table 27 indicates Hungary also falls short of percent defense expenditure spent on major equipment, spending only 15.34 percent.

Slovakia ranks 19th in NATO for defense expenditure at \$1,098 million in 2017. Slovakia has steadily increased its defense spending since 2013 from \$799 million to \$1,098 million in 2017. Slovakia falls fairly short of the equivalent of two-percent GDP goal at 1.19 percent GDP spent on defense. However, Slovakia does meet the 20-percent equipment goal, spending 20.42 percent of its defense expenditure on major equipment.

Slovenia ranks almost at the bottom overall in NATO for defense expenditure; Slovenia ranks 25th overall in spending at \$463 million on defense in 2017. Since 2015, Slovenia increased its defense spending from \$399 million in 2015 to \$463 million in 2017. Slovenia falls severely short of NATO's equivalent of two-percent GDP goal and woefully short of the 20 percent equipment goal. In 2017, Slovenia spent 0.93 percent of its GDP on defense and only 4.01 percent of its defense expenditure on equipment.

The overall trend for NATO's entire eastern flank is increased defense spending since the Russian incursion into Ukraine in 2014. Estonia, Latvia, Lithuania, and Poland, the four countries with a NATO enhanced forward presence are all achieving or are close to achieving the NATO equivalent of two percent GDP spent on defense and the 20 percent defense expenditure spent on major equipment goals. With the exception of Slovakia, all eastern flank countries are achieving or close to achieving the 20 percent major equipment goal. However, four of the nine NATO eastern flank countries are not close to achieving the equivalent of two percent GDP goal.

3.5.4 Impact of post-9/11 Terrorism on NATO's defense spending

On 11 September 2001 (9/11), as per Table 22, there were 19 members of NATO; Montenegro (2017), Albania (2009), Slovenia (2004), Latvia (2004), Estonia (2004), Croatia (2009), Lithuania (2004), Bulgaria (2004), Slovakia (2004), and Romania (2004) had yet to join. However, the effects of 9/11 on all current NATO countries will be examined, except for Montenegro which wasn't yet a recognized country in 2001, and Iceland which has no defense expenditure. All data for this section was pulled from Table 24, NATO defense expenditure in 2016 constant USD.

Luxembourg decreased from \$264 million in 2001 to \$249 million in 2003. Luxembourg did not significantly pass its 2001 level of defense spending until 2015 when it spent \$276 million, eventually reaching \$310 million by 2017.

Croatia decreased its defense expenditure from \$1 041 million in 2001 to \$911 million in 2003. Croatia continued to spend less than 2001 levels, spiking only briefly in 2008 to \$1,032 million.

Lithuania decreased its defense spending from \$308 million in 2001 to \$300 million in 2003. However, starting in 2004, Lithuania increased its defense spending each year through 2008, eventually reaching \$470 million by 2008.

Portugal's defense spending decreased slightly from \$3,775 million in 2001 to \$3,744 million in 2003, but increased to \$4,215 million in 2005 and then hit its pinnacle in 2009 at \$4,303 million.

Denmark decreased its defense spending from \$4,010 million in 2001 to \$3,846 million in 2003. However, Denmark then increased its defense spending in the following years, hitting highs in 2006 at \$4,030 million, 2008 at \$4,036 million, and 2010 at \$4,040 million. From 2011-2017, Denmark never exceeded its defense spending from the heights of \$4,030 – 4,040 million.

Belgium decreased its defense spending from \$4,981 million in 2001 to \$4,883 million in 2003. Belgium continued during the years 2004-2007 at a decreased defense spending level from 2001. In 2008, Belgium hit its pinnacle of defense spending at \$5,377 million, but decreased almost each year since.

Greece decreased its defense spending from \$7,328 million in 2001 to \$6,156 million in 2003. Yet, starting in 2004, Greece increased its defense spending each year until 2009 when it reached its pinnacle of defense spending at \$8,865 million.

Spain decreased its defense spending from \$17,073 million in 2001 to \$16,062 million in 2003. However, from 2004-2008, Spain increased its defense spending to its height at \$18,207 million in 2007 and \$18,107 million in 2008. From 2009-2016, Spain's defense spending steadily declined to an all-time low in 2016 at \$14,014 million.

Turkey decreased its defense spending from \$15,483 million in 2001 to \$14,869 million in 2003 but decreased to its lowest defense spending levels in 2005 at \$12,846 million.

In 2001, Albania spent \$91 million on defense. By 2003, Albania had increased its defense expenditure to \$103 million. From 2004-2008, Albania increased its defense spending each year, reaching a pinnacle in 2008 at \$208 million.

Slovenia likewise increased its defense expenditure from \$447 million in 2001 to \$516 million in 2003. From 2004-2009, Slovenia increased its defense spending each year, reaching a pinnacle in 2009 at \$686 million.

Latvia increased its defense expenditure from \$153 million in 2001 to \$288 million in 2003. From 2004-2007, Latvia increased its defense spending each year, reaching a pinnacle in 2007 at \$496 million.

Estonia also increased its defense expenditure from \$184 million in 2001 to \$254 million in 2003. From 2004-2007, Estonia increased its defense spending each year, reaching a pinnacle in 2007 at \$455 million.

Bulgaria increased its defense spending from \$881 million in 2001 to \$906 million in 2003, more than Bulgaria spent in 2017 (\$843 million). Bulgaria reached its height of defense spending 2007 at \$1,043 million, six years after 9/11.

Slovakia increased its defense spending from \$1,080 million in 2001 to \$1,160 million in 2003, increasing each year after 9/11 through 2008 when it spent the most Slovakia ever spent, \$1,228 million.

Hungary increased its defense spending from \$1,522 million in 2001 to \$1,795 million in 2003. However, Hungary did not sustain this level of spending, decreasing each year until 2014 when Hungary spent \$1,002 million.

Czech Republic increased its defense spending from \$2,444 million in 2001 to \$2,837 million in 2003. Czech Republic's defense spending spiked to a pinnacle in 2005 at \$2,976 million and then declined significantly reaching a low in 2014 at \$1,735 million.

Romania increased its defense spending from \$1,844 million in 2001 to \$1,892 million in 2003. Romania continued to increase its defense spending eventually reaching a height in 2008 at \$2,344 million.

Norway increased its defense spending from \$4,229 million in 2001 to \$5,081 million in 2002 and \$5,009 million in 2004. Norway continued to gradually increase its defense spending almost each year until reaching its pinnacle to \$6,330 million in 2017.

Poland increased its defense spending each year from 2001-2007, spending 5,070 million in 2001 and \$7,213 million in 2007. Poland's defense spending took a hit in 2008, dropping to \$6,548 million, but rebounded in 2009 and continued its pattern of increased defense spending until reaching \$9,519 million in 2017.

The Netherlands increased its defense spending from \$9,792 million in 2001 to \$9,856 million in 2003. The Netherlands' defense spending continued to increase 2004-2009, reaching a pinnacle in 2009 at \$10,601 million. Its defense spending decreased each year until 2015 reaching a low at \$8,653 million.

Canada increased its defense spending from \$12,843 million in 2001 to \$13,146 million in 2003. From 2004-2009, Canada increased its defense spending to a height of \$18,313 million in 2009. From 2010-2014, Canada experienced decreased spending levels, but began rebounding in 2015.

Italy increased its defense spending from \$35,187 million in 2001 to \$36,443 million in 2003 and \$36,559 million in 2004. From 2009, Italy's defense spending decreased, reaching an all-time low in 2015 at \$25,192 million.

Germany increased its defense spending only slightly from \$41,657 million in 2001 to \$41,199 million in 2003 but decreased from 2004-2007. Germany's defense spending then stayed fairly steady 2008-2016, spending between \$39,546 and \$41,579 million each year.

The United Kingdom increased its defense spending from \$45,297 million in 2001 to \$51,699 million in 2003. From 2004-2009, the UK's defense spending increased annually until it eventually reached a pinnacle of \$58,315 million in 2009. From 2010-2017, the UK's defense spending levels decreased, never again reaching 2009 levels.

France increased its defense spending from \$50,718 million in 2001 to \$53,319 million in 2003. France reached its pinnacle of defense spending in 2009, spending \$57,184 million. From 2010-2013, France spent at decreased levels on defense and didn't surpass its 2009 defense spending level until 2016 when France spent \$57,358 million.

The United States significantly increased its defense spending following 9/11. The US increased spending each year from \$423,911 million in 2001 until its height of \$768,466 million in 2010. From 2010-2017, the US has decreased defense spending each year, reaching \$587,178 million in 2017.

Overall 18 NATO countries increased their defense spending directly following 9/11, beginning their increased spending between 2002 and 2004: Albania, Lithuania, Portugal, Denmark, Greece, Spain, Slovenia, Latvia, Estonia, Bulgaria, Slovakia, Romania, Poland, Netherlands, Canada, UK, France, and the US. These 18 countries also all participated in NATO's mission in Afghanistan and, with the exception of Canada and France, are still in 2018 serving in Afghanistan as part of NATO's Resolute Support Mission.

Of note, all countries except for Denmark, Norway, and Poland continued post 9/11 to increase their defense spending until 2008-2010 when all showed a pattern of decreased spending coinciding with Europe's economic crisis.

Coinciding with the year ISIS established the Caliphate, began carrying out attacks in Europe, and ramping up recruiting efforts in Europe, 2014 marked the start of a continual defense expenditure increase for numerous NATO countries. Studying the data in Table 24, Greece, Hungary, Czech Republic, and Portugal began their annual increase in 2014. Denmark, Bulgaria, Slovenia and Belgium began their annual increase trend in 2015. Many other countries such as Montenegro, Luxembourg, Latvia, Estonia, Lithuania, Romania, Netherlands, and Canada have also been increasing their defense expenditure since 2014, but started the upward glide path earlier from 2010-2013.

Looking at Table 22, an overall 19 countries have been directly impacted by ISIS on their own sovereign territory by either attacks or terrorist plots since 2014: Portugal, Spain, UK, Denmark, Netherlands, Belgium, France, Germany, Poland, Czech Republic, Italy, Greece, Hungary, Romania, Bulgaria, Albania, Canada, Turkey, and the US. Of these 19 countries, only Belgium, Bulgaria, and Denmark began their defense spending increase following 2014. Other countries began prior to the start of ISIS attacks: Greece, Hungary, Czech Republic, and Portugal began increasing their defense expenditure in 2014 while Romania, Netherlands, and Canada started somewhere between 2010 and 2013. Overall this suggests the threat of ISIS attacks may have been a motivating factor for Belgium, Bulgaria, and Denmark to increase defense spending, as well as a contributing factor for Greece, Hungary, Czech Republic, Portugal, Romania, Netherlands, and Canada to continue their upward defense spending glide path.

4 Conclusion

Research concluded that ten members of NATO met or were close to meeting the equivalent of two percent GDP goal in 2017: USA 3.57 percent, Greece 2.36 percent, Estonia 2.08 percent, UK 2.12 percent, Poland 1.99 percent, Romania 1.80 percent, France 1.79 percent, Latvia 1.75 percent, Lithuania 1.73 percent, and Norway 1.62 percent. The USA, UK, and Greece are the only countries historically meeting the equivalent of two percent GDP spent on defense goal. The US and the UK are also the only top five members with highest GDPs in NATO who meet the equivalent of two percent GDP spent on defense goal. France, Germany, and Italy fall short of the equivalent of two percent GDP goal, but are in the NATO's five highest GDPs.

Thirteen NATO members met in 2017 or were close to meeting the 20 percent of defense expenditure on major defense equipment goal: (1) Luxembourg 32.99 percent; (2) Turkey 30.4 percent; (3) Lithuania 31.09 percent, (4) Bulgaria 29.54 percent, (5) USA 28.43 percent, (6) Norway 25.52 percent, (7) France 24.17 percent, (8) Poland 22.14 percent, (9) UK 22.03 percent, (10) Italy 20.94 percent, (11) Slovakia 20.42 percent, (12) Canada 19.42 percent and (13) Estonia 19.24 percent.

Only three countries met both the equivalent of two-percent GDP and the 20 percent equipment goals in 2017: USA, the UK, and Poland. Yet, unlike the equivalent of two percent GDP goal, all top five members with highest GDPs in NATO in 2017 have reached the goal of spending 20 percent of defense expenditure on major equipment with the exception of Germany.

Notably, Germany is the only country in the top five GDPs in NATO to meet neither the equivalent of two percent GDP spent on defense nor the 20 percent of defense expenditure spent on major defense equipment goals. Although Germany is NATO's top GDP on the European Continent and fourth overall in defense expenditure, Germany has decreased its defense spending since 1999 in comparison with 2017 by 0.05 percent, which can be seen in Table 24.

Interestingly, the top five members with highest GDPs in NATO do not rank in the top five GDPs per capita in NATO, indicating in NATO that a country's GDP per capita is not a good barometer for its overall GDP rank in NATO. The US falls from the top GDP spot to fifth overall in GDP per capita. Germany drops from second place in GDP to eighth place GDP per capita. France falls from third in real GDP to 10th in GDP per capita. The UK similarly drops from fourth overall in real GDP to 11th in GDP per capita, while fifth-ranked Italy in GDP decreases to 12th overall in GDP per capita.

Overall, Pearson correlation tests conducted in the years 2000, 2009, and 2017 reveal in NATO there is a positive, strong significant correlation between real GDP and defense expenditure in NATO. In other words, for NATO members, as real GDP increases, defense expenditure increases.

There is also a positive, strong significant correlation between real GDP and equivalent of percent GDP spent on defense in NATO in 2009 and 2017, showing as real GDP increases, equivalent of percent GDP increases. The year 2000 correlational test does not have the same sample size as years 2009 and 2017's tests because 12 countries were missing data on account of not being NATO members or having no military (Iceland). This could be the reason why these not significant results do not match the pattern of the years 2009 and 2017 significant results.

After conducting a Pearson correlation test, no correlation was found between the real GDP and percent defense expenditure spent on major new equipment in 2000 and 2017. A positive, significant correlation between real GDP and equivalent of percent GDP spent on defense in NATO in 2009 was calculated; however, there was only a medium strong (or moderate strength)

correlation indicating overall in NATO a change in real GDP may not affect a positive change in the percent defense expenditure spent on major new equipment.

In NATO, approximately two-thirds of the members have seen a positive increase in defense expenditure since 1999 while 10 countries have seen a decrease. The top reductions in defense spending since 1999 are Croatia -53.01 percent, Greece -30.15 percent, Belgium -17.68 percent, Italy -15.26 percent, and Czech Republic -14.75 percent. NATO's top three defense spenders (US, UK, and France), however, have seen positive percentage increases in defense expenditure since 1999. Of NATO's top 10 defense spenders, Germany, Netherlands, Spain, and Italy have decreased in their defense expenditure since 1999. These countries are mainly Western European countries and the oldest members of NATO and positioned farthest away from the existential threat Russia poses.

Eight of the bottom 10 defense expenditures in NATO spend less than \$1,000 million annually on defense and all joined NATO during NATO's wave of expansionism since 2004: Iceland, Montenegro, Albania, Luxembourg, Slovenia, Latvia, Estonia, Croatia, Lithuania, and Bulgaria. Notably, of these countries, Latvia has had the greatest percentage increase in defense expenditure from 1999-2017 in NATO at 405.20 percent, followed by Lithuania 284.35 percent, and Estonia 280.45 percent. Albania had the fifth largest percentage increase at 108.43 percent, while Luxembourg 50.13 percent, Slovenia 15.83 percent, and Bulgaria 9.34 percent have all seen significant increases since 1999.

In 2017, a NATO ally's defense expenditure per capita rank within NATO typically remains approximately the same (within 1-4 ranks) as its GDP per capita rank. This indicates that a NATO member's defense expenditure per capita rank is reflective of its overall GDP per capita rank in NATO. There are seven total exceptions to this rule and six of seven of these countries rank higher on defense expenditure per capita and then fall in overall GDP per capita rank. Poland, Estonia, Luxembourg, Greece, France, and the UK. Slovenia is the only country that has a higher ranked GDP per capita than its defense expenditure per capita.

Pearson correlation tests conducted in the years 2009 and 2017 reveal in NATO there is a positive, strong significant correlation between defense expenditure and equivalent of percent GDP spent on defense, indicating for NATO members, as defense expenditure increases, equivalent of percent GDP spent on defense increases. However, no correlation was found between the defense expenditure in 2000 and equivalent of percent GDP spent on defense in 2000. The year 2000 correlational test does not have the same sample size as years 2009 and 2017's tests because 12 countries were missing data on account of not being NATO members or having no military (Iceland). This could be the reason why these not significant results do not match the pattern of the years 2009 and 2017 significant results

Pearson correlation tests between defense expenditure and percent defense expenditure spent on major new equipment in years 2000, 2009, and 2017 indicate that a change in defense expenditure may not affect a positive change in the percent defense expenditure spent on major new equipment. For the 2000 and 2017 tests, no correlation was found between defense expenditure and percent defense expenditure spent on major new equipment. While the 2009 test did show a positive, significant correlation, the strength was only medium between the variables defense expenditure and percent defense expenditure spent on major new equipment.

Addressing the impact of geographical size on NATO members' defense expenditure, it was found that the seven largest countries geographically in NATO (Canada, USA, Turkey, France, Spain, Germany, Norway) rank in the top 11 of defense expenditures. However, except for the USA, the other six largest NATO's countries in geographical size do not spend equivalent of 2 percent of GDP on defense. However, all seven largest geographically countries except for Germany either meet the 20 percent equipment goal or come within less than a percent of

meeting the goal. Pearson correlation tests between geographical size and defense expenditure for years 2000, 2009, and 2017 showed a positive, strong significant correlation between the geographical size and defense expenditure. The correlation indicates in NATO, that as geographical size increases, defense expenditure increases.

Landlocked countries in NATO (Czech Republic, Hungary, Luxembourg, and Slovakia) all rank in the bottom half of defense expenditures for NATO. The four landlocked countries also did not meet the equivalent of two percent GDP goal in 2017. However, two of the four countries did meet the 20 percent equipment goal: Luxembourg and Slovakia.

As for the impact of a NATO member's population on defense expenditure, it was found with the exception of the USA and the UK, NATO's six largest populations (USA, Turkey, Germany, France, UK, and Italy) did not meet the equivalent of two percent GDP goal in 2017. NATO's top six most populous countries meet the 20 percent equipment goal except for Germany at 13.75 percent. Pearson correlation tests between population and defense expenditure for years 2000, 2009, and 2017 showed a positive, strong significant correlation between the geographical size and defense expenditure. The correlation indicates in NATO, that as population size increases, defense expenditure increases.

The countries on NATO's eastern flank (Bulgaria, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, and Slovenia) are all trending upward in defense spending. Poland, the only NATO ally in Central Europe and on NATO's eastern flank to rank in the NATO's top 10 defense expenditure, has almost doubled its defense spending since 1999, meeting both NATO goals of equivalent of two percent of GDP on defense and 20 percent of defense expenditure spent on equipment. Romania has more than doubled its defense expenditure since 2012 and currently ranks in the top half of NATO members' defense expenditures, as well as almost meets the equivalent of two percent GDP on defense goal and meets the 20 percent of defense expenditure on major equipment goal. The remaining seven countries on NATO's eastern flank rank in the bottom half of defense expenditures in NATO but have made great strides in increasing their defense expenditure, equivalent of percent GDP spent on defense, and percent defense spent on major equipment.

The overall trend for NATO's entire eastern flank is increased defense spending since the 2014 Russian incursion into Ukraine. Estonia, Latvia, Lithuania, and Poland, the four countries with a NATO enhanced forward presence are all achieving or are close to achieving the NATO equivalent of two percent GDP spent on defense and the 20 percent defense expenditure spent on major equipment goals. With the exception of Slovakia, all eastern flank countries are achieving or close to achieving the 20 percent major equipment goal. These eastern flank trends suggest the perception of a threat from Russia is a contributing factor to NATO Allies' increased defense spending.

Looking at the impact of post-9/11 terrorism on NATO's defense spending, eighteen NATO countries increased their defense spending directly following 9/11, beginning their increased spending between 2002 and 2004: Albania, Lithuania, Portugal, Denmark, Greece, Spain, Slovenia, Latvia, Estonia, Bulgaria, Slovakia, Romania, Poland, Netherlands, Canada, UK, France, and the US. These 18 countries also all participated in NATO's mission in Afghanistan and, with the exception of Canada and France, are currently still serving in Afghanistan as part of NATO's Resolute Support Mission. This trend suggests the threat of terrorism following 9/11 could potentially be a contributing factor to increased NATO's increased defense spending trend.

NATO's defense spending also indicates the economic crisis directly interrupted defense expenditure increases following 9/11. Sixteen NATO members' defense expenditures hit a pinnacle around 2008/9 and decreased the years directly following: Albania, Montenegro,

Slovenia, Latvia, Estonia, Lithuania, Bulgaria, Slovakia, Portugal, Denmark, Romania, Belgium, Greece, Spain, Canada, United Kingdom, and the United States. Most defense spending began rebounding early- to mid-2010s following the 2008-09 highs: Montenegro (2013), Slovenia (2015), Latvia (2012), Estonia (2010), Lithuania (2012), Bulgaria (2015), Slovakia (2013), Portugal (2014), Denmark (2015), Romania (2012), Belgium (2015), Greece (2014), and Canada (2013).

Furthermore, coinciding with the year ISIS began its operations in Europe, 2014 marked the start of a defense expenditure increase for numerous NATO countries directly affected by ISIS attacks or plots. Countries such as Greece, Hungary, Czech Republic, and Portugal began their annual defense expenditure increase in 2014. Denmark, Bulgaria, and Belgium began their annual increase trend in 2015. Other countries such as Romania, Netherlands, and Canada started their upward glide path for defense expenditures earlier from 2010-2013. Overall this finding suggests the threat of ISIS attacks may have been a motivating factor for Belgium, Bulgaria, and Denmark to increase defense spending, as well as a contributing factor for Greece, Hungary, Czech Republic, Portugal, Romania, Netherlands, and Canada to continue their upward defense spending glide path.

Based on findings in the practical part, it is recommended to leaders encouraging NATO members to increase defense spending to cease focusing solely on the failure to meet the equivalent of two percent GDP spent on defense goal. Instead, leaders should instead highlight threats to a country's national interests and how increased defense spending could counter these threats. Specifically, in NATO, perceived threats such as terrorism or a resurgent Russia are shown to impact a country's defense spending over time.

Furthermore, with only three NATO countries meeting both the equivalent of two-percent GDP and the 20 percent equipment goals and five NATO allies meeting the equivalent of two-percent GDP goal, focusing solely on the equivalent of two percent GDP goal seems counterproductive. Thirteen allies, however, meet the 20 percent equipment goal. Politicians would be better served focusing on allies meeting the 20 percent equipment goal and could, therefore, try to shape new major equipment purchases to shore up capability gaps in NATO.

A final recommendation would be for NATO to set a goal to increase defense expenditure by a positive number each year. With 10 NATO countries decreasing defense expenditures since 1999, these countries including GDP the powerhouse Germany, could offer more to NATO's collective defense capabilities through long-term upward trends in defense expenditures.

References

Books and Magazines

- ADEBAMBO, B; BROCKMAN, P; YAN, X. *Anticipating the 2007–2008 Financial Crisis: Who Knew What and When Did They Know It?*. Journal of Financial & Quantitative Analysis. 50, 4, 647-669, Aug. 2015. ISSN 00221090.
- ASSA, J. *The Financialization of GDP: Implications for economic theory and policy*. Abingdon : Taylor & Francis, 2016, 118p. ISBN 9781317329909
- AUERSWALD, D. and SAIDEMAN, S. *NATO in Afghanistan: fighting together, fighting alone*. Princeton, NY : Princeton University Press, 2014. 260 p. ISBN 978-0-691-15938-6.
- BREZINA, C. *Understanding the gross domestic product and the gross national product*. New York, NY : The Rosen Publishing Group, Inc, 2012. 80 p. ISBN 978-1-4488-5569-8
- CASTILLO, J. *Military expenditures and economic growth*. Santa Monica : RAND Corporation, 2001. 116 p. ISBN 0-8330-2896-0.
- COLLINS, B J. *NATO: a guide to the issues*. Santa Barbara : Praeger/ABC-CLIO, 2011. 175p. ISBN 978-0-313-35492-2.
- DENI, J. R. "Perfectly Flawed? The Evolution of NATO's Force Generation Process." p.176-193. In *NATO's Post-Cold War Politics: The Changing Provision of Security*. Edited by Sebastian Mayer. New York, NY : Palgrave Macmillan, 2014. 343 p. ISBN 978-0-230-00216-6.
- GORTON, G. *Slapped by the invisible hand the panic of 2007*. (Financial Management Association survey and synthesis series). New York : Oxford University Press, 2010. 222 p. ISBN 9780199734153.
- HALLAMS, E. *The United States and NATO since 9/11: The transatlantic alliance renewed*. New York, NY : Routledge, 2010. 166 p. ISBN 10 0-415-55368-7.
- KASHMERI, S.A. *NATO 2.0: Reboot or Delete*. Washington D.C. : Potomac Books, 2011. 243 p. ISBN 978-1-59797-664-0.
- KAUFMAN, GG. *The global financial crisis: a retrospective look*. (Journal of Financial Economic Policy: Volume 7 Number 1). Bradford, West Yorkshire : Emerald, 2015. 88 p. ISBN 9781785600814.
- MOSS, D. *A Concise Guide to Macroeconomics* Brighton, Massachusetts : Harvard Business Review Press, 2014. ISBN: 9781625271969
- NEVO, D. *Making Sense of Data Through Statistics: An Introduction*. New York : Rensselaer Polytechnic Institute, 2017. 547 p. ISBN 978 -0- 9857955-8-0.
- ROUSE, W. B. *The economics of human systems integration: valuation of investments in people's training and education, safety and health, and work productivity*. New Jersey : Wiley, Hoboken, 2010. ISBN 978-0-470-48676-4.
- SALKIND, N. J., and RASMUSSEN, K. (2007). *Encyclopedia of measurement and statistics*. Thousand Oaks : SAGE Publications, 2007. 1058 p. ISBN 9781412916110.
- WILDAVSKY, A. *Budgeting: a comparative theory of budgetary processes*. 2nd, rev. ed. New Brunswick : Transaction Publishers, 2002. 425 p. ISBN 08873806040.

Online Sources

BRADDON, D. What lies ahead? Defence budgets and the financial crisis. *NATO Review* [online]. May 2009 [cit. 2018-08-03]. Available at WWW: <https://www.nato.int/docu/review/2009/FinancialCrisis/Defence-Budget-Financial-Crisis/EN/index.htm>.

CAFARELLO, J. and ZHOU, J. ISIS's Expanding Campaign in Europe. *Institute for the Study of War* [online]. 2015-10-20 [cit. 2018-07-06]. Available at WWW: <http://www.understandingwar.org/sites/default/files/ISIS%20in%20Europe%20Update%20September-2017.pdf>.

CIA. The World Factbook. *Central Intelligence Agency* [online]. 2018 [cit. 2018-06-20]. Available at WWW: <https://www.cia.gov/library/publications/the-world-factbook/geos/ay.html>.

CHANTRILL, C. Public Spending Details for 2018. *UKpublicspending.com* [online]. 2018 [cit. 2018-08-01]. Available at WWW: https://www.ukpublicspending.co.uk/uk_budget_pie_chart.

DAVIES, J. Global Financial Crisis - What caused it and how the world responded. *Canstar* [online]. 2017-06-23 [cit. 2018-08-03]. Available at WWW: <https://www.canstar.com.au/home-loans/global-financial-crisis>.

EUROPOL. European Union Terrorism Situation and Trend Report 2018. *Europol* [online]. 2018 [cit. 2018-08-02]. Available at WWW: <https://www.europol.europa.eu/activities-services/main-reports/european-union-terrorism-situation-and-trend-report-2018-tesat-2018>.

GATES, M. The Security and Defense Agenda (Future of NATO), Brussels, Belgium. U.S. *Department of defense* [online]. 2011-06-10 [cit. 2018-06-15]. Available at WWW: <http://archive.defense.gov/speeches/speech.aspx?speechid=1581>.

GOBBI, F.P. NATO in the aftermath of the financial crisis. *European Parliament* [online]. 2013-04-13 [cit. 2018-08-03]. Available at WWW: http://www.europarl.europa.eu/RegData/bibliotheque/briefing/2013/130453/LDM_BRI%282013%29130453_REV1_EN.pdf.

GVOSDEV, N. K. There's More to NATO than Article 5. *The National Interest* [online]. 2016-08-02 [cit. 2018-07-02]. Available at WWW: <http://nationalinterest.org/feature/theres-more-nato-article-five-17222>.

LEVIT, M., AUSTIN D.A., and STUPAK, J. Mandatory Spending Since 1962. (Congressional Research Service Report No. 33074). *Congressional Research Service Report* [online]. 2015-03-18 [cit. 2018-7-31]. Available at WWW: <https://fas.org/sgp/crs/misc/RL33074.pdf>.

LISTER, T., SANCHEZ, R., BIXLER, M., O'KEY, S., HOGENMILLER, M., and TAWFEEQ, M. ISIS goes global: 143 attacks in 29 countries have killed 2,043. *CNN* [online]. 2018 [cit. 2018-08-02]. Available at WWW: <https://www.cnn.com/2015/12/17/world/mapping-isis-attacks-around-the-world/index.html>.

MEJDINI, F. Albania Police Heighten Security Against Terrorist Threat. *Balkan Insight* [online]. 2017 [cit. 2018-08-02]. Available at WWW: <http://www.balkaninsight.com/en/article/albanian-police-raise-security-measures-against-terrorist-attacks-08-24-2017>.

NATIONAL PRIORITIES PROJECT. Federal Spending: Where does the Money Go? *Institute for Policy Studies* [online]. 2018 [cit. 2018-08-01]. Available at WWW: <https://www.nationalpriorities.org/budget-basics/federal-budget-101/spending/>.

NATO. Defence and Related Security Capacity Building Initiative. *North Atlantic Treaty Organization* [online]. 2018f [cit. 2018-07-06]. Available at WWW: https://www.nato.int/cps/en/natohq/topics_132756.htm.

NATO. Financial and economic data relating to NATO Defence NATO: Defence Expenditure of NATO Countries (2010-2017). *North Atlantic Treaty Organization* [online]. 2018a [cit. 2018-06-23]. Available at WWW: https://www.nato.int/cps/ic/natohq/news_152830.htm.

NATO. Financial and economic data relating to NATO Defence NATO: Defence expenditures of NATO Countries (1975-1999). *North Atlantic Treaty Organization* [online]. 1999 [cit. 2018-06-28] Available at WWW: https://www.nato.int/cps/en/natolive/news_26178.htm?mode=pressrelease.

NATO. Financial and economic data relating to NATO Defence NATO: Defence Expenditure of NATO Countries (1985-2009). *North Atlantic Treaty Organization* [online]. 2010 [cit. 2018-06-20]. Available at WWW: https://www.nato.int/cps/en/natolive/news_64221.htm?mode=pressrelease.

NATO. ISAF's mission in Afghanistan (2001-2014) (Archived). *North Atlantic Treaty Organization* [online]. 2015 [cit. 2018-07-06]. Available at WWW: https://www.nato.int/cps/en/natohq/topics_69366.htm.

NATO. NATO's Enhanced Forward Presence. *North Atlantic Treaty Organization* [online]. 2018g [cit. 2018-07-13]. Available at WWW: https://www.nato.int/nato_static_fl2014/assets/pdf/pdf_2018_02/20180213_1802-factsheet-efp.pdf.

NATO. Nato Members. *North Atlantic Treaty Organization* [online]. 2018b [cit. 2018-06-28]. Available at WWW: <https://www.nato.int/nato-welcome/index.html#members>.

NATO. The North Atlantic Treaty (1949). *North Atlantic Treaty Organization* [online]. 2009 [cit. 2018-06-12]. Available at WWW: https://www.nato.int/nato_static/assets/pdf/stock_publications/20120822_nato_treaty_en_light_2009.pdf.

NATO. Resilience and Article 3. *North Atlantic Treaty Organization* [online]. 2018c [cit. 2018-06-13]. Available at WWW: https://www.nato.int/cps/ie/natohq/topics_132722.htm.

NATO, Resolute Support Mission in Afghanistan. *North Atlantic Treaty Organization* [online]. 2018d [cit. 2018-07-06]. Available at WWW: https://www.nato.int/cps/en/natohq/topics_113694.htm.

NATO. Resolute Support Mission: Key Facts and Figures. *North Atlantic Treaty Organization* [online]. 2018e [citation 2018-07-11]. Available at WWW: https://www.nato.int/nato_static_fl2014/assets/pdf/pdf_2018_07/20180706_2018-07-RSM-Placemat.pdf.

NATO. Wales Summit Declaration. *North Atlantic Treaty Organization* [online]. 2014 [cit. 2018-06-15]. Available at WWW: https://www.nato.int/cps/ic/natohq/official_texts_112964.htm.

OMB. US Office of Management and Budget, *A citizen's guide to the federal budget* [online]. 2012 [cit. 2019-01-10]. Available at WWW: <https://www.govinfo.gov/content/pkg/BUDGET-2002-CITIZENSGUIDE/pdf/BUDGET-2002-CITIZENSGUIDE.pdf>

PARISH, K. EUCOM, NATO confront dynamic challenges from Russia to ISIS. *US Department of defense* [online]. 2017-03-27 [cit. 2018-07-10]. Available at WWW: <https://www.defense.gov/News/Article/Article/1128170/eucom-nato-confront-dynamic-challenges-from-russia-to-isis/>.

PERKOVICH, G., CHALMERS, M., PIFER, S., SCHULTE, P., and TANDLER, J. Looking Beyond the Chicago Summit Nuclear Weapons in Europe and the Future of NATO. *The Carnegie Papers* [online]. April 2012 [cit. 2018-08-03]. Available at WWW: https://carnegieendowment.org/files/beyond_chicago_summit.pdf.

RASMUSSEN, S. E. Nato ends combat operations in Afghanistan. *The Guardian* [online]. 2015-12-28 [cit. 2018-07-06]. Available at WWW: <https://www.theguardian.com/world/2014/dec/28/nato-ends-afghanistan-combat-operations-after-13-years>.

SCAPAROTTI, C. EUCOM Posture Statement 2018. *US European Command* [online]. [cit. 2018-03-08]. Available at WWW: <http://www.eucom.mil/mission/eucom-posture-statement-2018>.

SHLAPAK, D. and JOHNSON, M. Reinforcing Deterrence on NATO's Eastern Flank: Wargaming the Defense of the Baltics. Santa Monica, CA: *RAND Corporation* [online]. 2016 [cit. 2018-07-08]. 16 p. ISBN 9780833092984. Available at WWW: https://www.rand.org/pubs/research_reports/RR1253.html.

SIPRI. Data for all countries 1949-2017. *Stockholm International Peace Research Institute* [online]. 2018a [cit. 2018-07-04]. Available at WWW: <https://www.sipri.org/sites/default/files/SIPRI-Milex-data-1949-2017.xlsx>

SIPRI. Military Expenditure Database: Sources and Methods. *Stockholm International Peace Research Institute* [online]. 2018b [cit. 2018-07-04]. Available at WWW: <https://www.sipri.org/databases/milex/sources-and-methods#definition-of-military-expenditure>.

STATISTA. Annual social spending as a share of gross domestic product (GDP) in France from 2006 to 2016. *Statista* [online]. 2018a [cit. 2018-07-25]. Available at WWW: <https://www.statista.com/statistics/467495/social-spending-share-france/>.

STATISTA. Distribution of France public budget in 2018, by spending area (in million euros). *Statista* [online]. 2018b [cit. 2018-07-31]. Available at WWW: <https://www.statista.com/statistics/467398/public-budget-breakdown-france/>.

THE WORLD BANK. World Development Indicators: GDP Constant 2010 US\$ (2018). *The World Bank* [online]. 2018 [cit. 2018-07-05]. Available at WWW: <https://data.worldbank.org/indicator/NY.GDP.MKTP.KD>.

THE CANADIAN PRESS. A list of terrorist incidents and attacks in Canada. *CTV News* [online]. 2017-10-01 [cit. 2018-08-02]. Available at WWW: <https://www.ctvnews.ca/canada/a-list-of-terrorist-incidents-and-attacks-in-canada-1.3614381>.

TRADING ECONOMICS. United Kingdom Government Spending to GDP. *Trading Economics* [online]. 2018 [cit. 2018-08-02]. Available at WWW: <https://tradingeconomics.com/united-kingdom/government-spending-to-gdp>.

TRUMP, D. Remarks by President Trump and NATO Secretary General Stoltenberg Before Expanded Bilateral Meeting. *The White House* [online]. 2018a [cit. 2018-07-29]. Available at WWW: <https://www.whitehouse.gov/briefings-statements/remarks-president-trump-nato-secretary-general-stoltenberg-expanded-bilateral-meeting/>.

TRUMP, D. Fiscal Year 2019: An American Budget, Office of Budget and Management, 2018. *The White House* [online]. 2018b [cit. 2018-8-1]. Available at WWW: <https://www.whitehouse.gov/wp-content/uploads/2018/02/budget-fy2019.pdf>.

US DEPARTMENT OF STATE. *North Atlantic Treaty Organization, 1949* [online]. 2018 [cit. 2018-06-21]. Available at WWW: <https://history.state.gov/milestones/1945-1952/nato>.

YACKLEY, A.J. and PAMUK, H. Islamic State suspected after suicide bombers kill 42 at Istanbul airport. *Reuters* [online]. 2016-06-28 [cit. 2018-08-02]. Available at WWW: <https://www.reuters.com/article/us-turkey-blast-idUSKCN0ZE2J1>.

ZIMMERMANN, N. German federal budget goes up for 2017. *DW* [online]. 2016 [cit. 2018-08-02]. Available at WWW: <https://www.dw.com/en/german-federal-budget-goes-up-for-2017/a-36528845>.

Appendix

Appendix 1 – NATO members’ information	I
Appendix 2 – NATO Members’ expenditure comparison to various factors	V
Appendix 3 –NATO Members reaching the main NATO goals	VIII

Appendix 1 – NATO members’ information

Table 22 Basic information about NATO members

Country	Joined	Landlocked	NATO Eastern Flank	ISIS Terrorist Attack or Arrest (2014-today)	Geographical Size (sq km)	Population (Jul 2017)
Albania	2009	NO	NO	YES	28,748	3,047,987
Belgium	1949	NO	NO	YES	30,528	11,491,346
Bulgaria	2004	NO	YES	YES	110,879	7,101,510
Canada	1949	NO	NO	YES	9,984,670	35,623,680
Croatia	2009	NO	NO	NO	56,594	4,292,095
Czech Republic	1999	YES	NO	YES	78,867	10,674,723
Denmark	1949	NO	NO	YES	43,094	5,605,948
Estonia	2004	NO	YES	NO	45,228	1,251,581
France	1949	NO	NO	YES	643,801	67,106,161
Germany	1955	NO	NO	YES	357,022	80,591,017
Greece	1952	NO	NO	YES	131,957	10,768,477
Hungary	1999	YES	YES	YES	93,028	9,850,845
Iceland	1949	NO	NO	NO	103,000	339,747
Italy	1949	NO	NO	YES	301,340	62,137,802
Latvia	2004	NO	YES	NO	64,589	1,944,643
Lithuania	2004	NO	YES	NO	65,300	2,823,859
Luxembourg	1949	YES	NO	NO	2,586	594,130
Montenegro	2017	NO	NO	NO	13,812	642,550
Netherlands	1949	NO	NO	YES	41,543	17,084,719
Norway	1949	NO	NO	NO	323,802	5,320,045
Poland	1999	NO	YES	YES	312,685	38,476,269
Portugal	1949	NO	NO	YES	92,090	10,839,514
Romania	2004	NO	YES	YES	238,391	21,529,967
Slovakia	2004	YES	YES	NO	49,035	5,445,829
Slovenia	2004	NO	YES	NO	20,273	1,972,126
Spain	1982	NO	NO	YES	505,370	48,958,159
Turkey	1952	NO	NO	YES	783,562	80,845,215
United Kingdom	1949	NO	NO	YES	243,610	65,648,100
United States	1949	NO	NO	YES	9,833,517	326,625,791

Source: own processing, CIA (2018)

Table 23 NATO Members' GDP in constant 2010 USD (billions USD)

Country	GDP '99	GDP '00	GDP '01	GDP '02	GDP '03	GDP '04	GDP '05	GDP '06	GDP '07	GDP '08	GDP '09	GDP '10	GDP '11	GDP '12	GDP '13	GDP '14	GDP '15	GDP '16	GDP '17	Rank '17
Albania	7	7	8	8	9	9	10	10	11	11	12	12	12	12	13	13	13	13	14	28
Belgium	397	411	415	423	426	441	450	462	478	481	471	484	492	493	494	501	508	515	524	11
Bulgaria	31	32	34	36	37	40	43	46	49	52	50	51	52	52	52	53	55	57	59	22
Canada	1,277	1,343	1,367	1,408	1,433	1,478	1,525	1,564	1,597	1,613	1,565	1,613	1,664	1,693	1,735	1,785	1,803	1,828	1,883	6
Croatia	45	47	48	51	54	56	58	61	64	66	61	60	60	58	58	58	59	61	63	21
Czech Republic	146	152	156	159	165	173	184	197	208	213	203	207	211	209	208	214	225	231	241	15
Denmark	287	298	300	302	303	311	319	331	334	332	316	322	326	327	330	335	341	348	355	13
Estonia	13	14	15	16	17	18	20	22	24	22	19	19	21	22	22	23	23	24	25	26
France	2,255	2,343	2,389	2,415	2,435	2,503	2,543	2,603	2,665	2,670	2,592	2,643	2,698	2,702	2,718	2,744	2,773	2,806	2,860	3
Germany	3,034	3,124	3,177	3,177	3,154	3,191	3,214	3,333	3,441	3,479	3,283	3,417	3,542	3,560	3,577	3,646	3,710	3,782	3,866	2
Greece	242	252	262	272	289	302	304	322	332	331	317	299	272	252	244	246	245	245	248	14
Hungary	103	107	111	116	121	123	132	137	138	139	130	131	133	131	134	139	144	143	153	18
Iceland	9	10	11	11	11	12	13	13	15	15	14	13	14	14	14	15	15	16	17	27
Italy	1,987	2,060	2,097	2,102	2,105	2,138	2,159	2,202	2,234	2,211	2,090	2,125	2,137	2,077	2,041	2,043	2,063	2,081	2,112	5
Latvia	16	16	17	19	20	22	24	27	30	29	25	24	25	26	27	27	28	29	30	25
Lithuania	23	24	26	28	31	33	35	38	42	43	37	37	39	41	42	44	45	46	47	24
Luxembourg	38	41	42	43	44	46	47	50	54	53	51	53	55	54	56	60	61	63	65	20
Montenegro	3	3	3	3	3	3	3	4	4	4	4	4	4	4	4	4	4	5	5	29
Netherlands	705	735	750	751	753	767	785	813	842	857	825	836	850	841	840	852	871	890	918	9
Norway	356	367	375	380	383	399	409	419	431	436	425	429	433	445	450	459	468	473	482	12
Poland	312	326	330	337	349	367	380	403	432	450	463	479	503	511	519	535	556	572	598	10
Portugal	213	221	226	227	225	229	231	235	241	241	239	238	234	225	222	224	228	232	238	16
Romania	108	110	116	122	130	140	146	158	168	182	171	167	170	172	178	184	191	200	214	17
Slovakia	55	55	57	60	63	66	71	77	85	90	85	90	92	94	95	98	101	105	108	19
Slovenia	35	37	38	40	41	42	44	47	50	51	48	48	48	47	47	48	49	51	53	23
Spain	1,092	1,150	1,196	1,230	1,270	1,309	1,358	1,415	1,468	1,485	1,434	1,432	1,417	1,376	1,352	1,371	1,418	1,464	1,509	7
Turkey	489	521	490	521	551	604	658	705	740	747	712	772	858	899	975	1,023	1,088	1,123	1,206	8
United Kingdom	2,021	2,095	2,148	2,201	2,275	2,328	2,400	2,459	2,517	2,505	2,400	2,441	2,477	2,513	2,565	2,643	2,705	2,758	2,807	4
United States	12,213	12,713	12,837	13,066	13,433	13,942	14,408	14,792	15,055	15,011	14,595	14,964	15,204	15,542	15,803	16,209	16,673	16,920	17,305	1

Source: own processing, WORLD BANK (2018)

Table 24 NATO Members' Defense expenditures in constant 2016 USD (millions USD)

Country	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Rank '17	% Change 1999-2017	
Albania	72.7	80.4	91	91	103	112	116	143	176	208	164	177	176	172	162	157	137	131	152	27	108.43%	
Belgium	5,211	5,211	4,981	4,830	4,883	4,781	4,607	4,571	4,932	5,377	5,065	4,851	4,681	4,629	4,510	4,437	4,273	4,314	4,290	13	-17.68%	
Bulgaria	771	795	881	889	906	885	905	898	1,043	874	830	789	669	685	732	690	654	755	843	20	9.34%	
Canada	12,719	12,511	12,843	12,908	13,146	13,643	14,243	14,905	16,251	17,513	18,313	16,540	17,099	16,260	15,030	15,275	17,561	18,132	19,837	6	55.96%	
Croatia	1,586	1,124	1,041	1,126	911	828	864	873	899	1,032	940	871	902	824	788	754	751	702	745	22	-53.01%	
Czech Republic	2,464	2,541	2,444	2,612	2,837	2,722	2,976	2,749	2,651	2,261	2,327	2,112	1,902	1,828	1,743	1,735	1,803	1,955	2,101	17	-14.75%	
Denmark	3,905	3,777	4,010	3,962	3,846	3,868	3,685	4,030	3,886	4,036	3,794	4,040	3,766	3,883	3,562	3,405	3,370	3,593	3,701	15	-5.24%	
Estonia	134	158	184	220	254	268	334	375	455	439	397	310	329	385	397	426	463	498	509	23	280.45%	
France	51,466	50,873	50,718	51,763	53,319	54,779	53,661	53,904	54,111	53,569	57,184	54,570	53,236	52,500	52,368	53,142	55,288	57,358	56,287	2	9.37%	
Germany	43,045	42,353	41,657	41,770	41,199	39,937	39,316	38,408	38,441	39,546	41,041	41,488	40,301	41,263	38,881	38,705	39,892	41,579	43,023	4	-0.05%	
Greece	7,100	7,493	7,328	7,188	6,158	6,770	7,321	7,612	7,606	8,455	8,865	6,813	5,485	4,851	4,530	4,493	4,765	4,963	4,959	12	-30.15%	
Hungary	1,256	1,386	1,522	1,662	1,795	1,661	1,645	1,474	1,502	1,396	1,244	1,116	1,131	1,076	1,017	1,002	1,128	1,289	1,350	18	7.44%	
Iceland	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	29	0.00%	
Italy	33,533	35,776	35,187	36,151	36,443	36,559	35,169	34,036	32,981	34,188	33,228	32,291	31,687	29,434	28,273	26,295	25,192	28,206	28,417	5	-15.26%	
Latvia	97	122	153	250	288	311	362	455	496	485	308	233	242	222	238	247	282	407	492	24	405.20%	
Lithuania	201	263	308	307	300	346	377	418	455	470	354	296	286	286	296	356	474	636	773	21	284.35%	
Luxembourg	206	211	264	235	249	262	265	259	269	201	199	251	217	211	218	234	276	261	310	26	50.13%	
Montenegro																						
Netherlands	10,027	9,629	9,792	9,729	9,856	9,916	9,953	10,366	10,509	10,355	10,601	10,189	9,835	9,209	8,573	8,641	8,653	9,115	9,780	9	-2.46%	
Norway	4,346	4,201	4,229	5,081	4,886	5,009	4,713	4,704	5,004	5,031	5,340	5,257	5,356	5,452	5,578	5,821	5,779	5,997	6,330	11	45.65%	
Poland	5,070	4,920	5,070	5,158	5,361	5,605	5,992	6,380	7,212	6,548	6,905	7,226	7,325	7,390	7,327	8,147	9,707	9,164	9,519	10	87.77%	
Portugal	3,524	3,629	3,775	3,880	3,744	3,976	4,215	4,095	3,919	3,934	4,303	4,243	4,054	3,600	3,967	3,465	3,577	3,569	3,662	16	3.92%	
Romania	1,847	1,758	1,844	1,834	1,892	2,035	2,152	2,218	2,127	2,344	1,993	1,836	1,899	1,847	1,988	2,173	2,506	2,644	3,975	14	115.22%	
Slovakia	922	959	1,080	1,094	1,160	1,078	1,168	1,185	1,199	1,228	1,174	1,028	882	882	799	825	978	1,003	1,098	19	19.00%	
Slovenia	400	364	447	496	516	547	558	639	643	681	686	683	551	474	420	403	399	449	463	25	15.83%	
Spain	16,706	17,265	17,073	15,826	16,062	16,789	16,998	17,555	18,207	18,107	17,382	17,495	16,139	16,322	14,240	14,219	15,114	14,014	15,686	8	-6.10%	
Turkey	17,452	16,890	15,483	16,474	14,869	13,569	12,846	13,784	13,252	13,401	14,340	14,050	14,187	14,498	14,857	14,942	15,412	17,854	19,580	7	12.19%	
United Kingdom	42,426	43,535	45,297	48,231	51,699	52,302	52,739	53,080	54,759	57,203	58,315	57,088	54,677	52,347	50,136	48,830	47,873	48,119	48,383	3	14.04%	
United States	404,830	420,496	423,911	475,971	541,734	590,447	618,605	628,211	644,705	692,402	747,940	768,466	758,988	715,838	659,064	618,341	603,625	600,106	597,178	1	47.51%	

Source: own processing, SIPRI (2018a) and SIPRI (2018b)

Table 25 NATO Eastern Flank Members' Defense expenditures (millions USD)

Year	Bulgaria	Estonia	Hungary	Latvia	Lithuania	Romania	Slovakia	Slovenia	Poland
1999	771	134	1,256	97	201	1,847	922	400	5,070
2000	795	158	1,386	122	263	1,758	959	364	4,920
2001	881	184	1,522	153	308	1,844	1,080	447	5,070
2002	889	220	1,662	250	307	1,834	1,094	496	5,158
2003	906	254	1,795	288	300	1,892	1,160	516	5,361
2004	885	268	1,661	311	346	2,035	1,078	547	5,605
2005	905	334	1,645	362	377	2,152	1,168	558	5,992
2006	898	375	1,474	455	418	2,218	1,185	639	6,380
2007	1,043	455	1,502	496	455	2,127	1,199	643	7,212
2008	874	439	1,396	485	470	2,344	1,228	681	6,548
2009	830	397	1,244	308	354	1,993	1,174	686	6,905
2010	789	310	1,116	233	296	1,836	1,028	683	7,226
2011	669	329	1,131	242	286	1,899	882	551	7,325
2012	685	385	1,076	222	286	1,847	882	474	7,390
2013	732	397	1,017	238	296	1,988	799	420	7,327
2014	690	426	1,002	247	356	2,173	825	403	8,147
2015	654	463	1,128	282	474	2,506	978	399	9,707
2016	755	498	1,289	407	636	2,644	1,003	449	9,164
2017	843	509	1,350	492	773	3,975	1,098	463	9,519

Source: own processing, SIPRI (2018a) and SIPRI (2018b)

Appendix 2 – NATO Members’ expenditure comparison to various factors

Table 26 NATO Members’ Defense Expenditure as equivalent of percent of their GDP

Country	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Albania											2.00	1.56	1.53	1.49	1.41	1.35	1.17	1.10	1.10
Belgium	1.50	1.40	1.30	1.30	1.30	1.20	1.10	1.10	1.10	1.20	1.20	1.08	1.04	1.04	1.01	0.98	0.92	0.92	0.90
Bulgaria						2.40	2.50	2.30	2.50	2.00	1.90	1.64	1.32	1.34	1.46	1.32	1.26	1.26	1.53
Canada	1.20	1.10	1.20	1.20	1.20	1.20	1.20	1.20	1.30	1.30	1.50	1.16	1.23	1.10	0.99	1.01	1.20	1.16	1.29
Croatia											1.70	1.54	1.60	1.53	1.47	1.41	1.37	1.23	1.26
Czech Republic	2.20	2.10	2.00	2.00	2.10	1.90	1.80	1.70	1.50	1.40	1.60	1.28	1.07	1.05	1.03	0.95	1.03	0.96	1.05
Denmark	1.60	1.50	1.50	1.50	1.40	1.40	1.30	1.40	1.30	1.40	1.40	1.40	1.31	1.35	1.23	1.15	1.12	1.17	1.17
Estonia						1.60	1.50	1.40	1.70	1.80	1.80	1.70	1.68	1.90	1.91	1.96	2.05	2.13	2.08
France	2.80	2.60	2.50	2.50	2.60	2.60	2.50	2.50	2.40	2.30	2.10	1.96	1.87	1.87	1.86	1.82	1.79	1.79	1.79
Germany	1.50	1.50	1.50	1.50	1.50	1.40	1.40	1.30	1.30	1.30	1.40	1.35	1.28	1.31	1.22	1.18	1.18	1.20	1.24
Greece	4.90	4.90	4.60	3.40	2.80	2.90	2.80	2.80	2.60	2.90	3.10	2.64	2.38	2.29	2.21	2.20	2.31	2.41	2.36
Hungary	1.60	1.70	1.80	1.70	1.70	1.50	1.40	1.20	1.30	1.20	1.10	1.03	1.05	1.03	0.95	0.86	0.92	1.02	1.06
Iceland																			
Italy	2.00	1.80	1.70	1.70	1.60	1.50	1.60	1.40	1.10	1.10	1.10	1.35	1.30	1.24	1.20	1.08	1.01	1.12	1.12
Latvia						1.30	1.30	1.60	1.50	1.60	1.20	1.06	1.01	0.88	0.93	0.93	1.04	1.46	1.75
Lithuania						1.40	1.30	1.30	1.20	1.20	1.20	0.88	0.79	0.76	0.76	0.88	1.14	1.49	1.73
Luxembourg	0.90	0.70	0.90	0.70	0.80	0.80	0.70	0.60	0.60	0.40	0.50	0.47	0.39	0.38	0.38	0.38	0.43	0.40	0.46
Montenegro												1.80	1.75	1.66	1.47	1.50	1.40	1.42	1.58
Netherlands	1.80	1.60	1.60	1.60	1.60	1.60	1.50	1.50	1.50	1.40	1.50	1.34	1.25	1.23	1.16	1.15	1.12	1.15	1.15
Norway	2.20	2.00	2.00	2.40	2.20	2.10	1.70	1.60	1.60	1.60	1.70	1.51	1.51	1.47	1.48	1.51	1.46	1.54	1.62
Poland	2.20	1.90	1.90	1.90	1.90	1.90	1.80	1.80	1.80	1.60	1.70	1.77	1.72	1.74	1.72	1.85	2.22	2.00	1.99
Portugal	2.20	2.10	2.10	1.60	1.60	1.70	1.70	1.60	1.50	1.50	1.60	1.49	1.49	1.41	1.44	1.31	1.33	1.28	1.31
Romania						2.20	2.00	1.80	1.50	1.50	1.40	1.24	1.28	1.22	1.28	1.35	1.45	1.41	1.80
Slovakia						1.80	1.70	1.60	1.50	1.50	1.50	1.27	1.09	1.09	0.98	0.99	1.13	1.12	1.19
Slovenia						1.60	1.40	1.60	1.50	1.50	1.60	1.61	1.30	1.17	1.05	0.97	0.93	1.00	0.98
Spain	1.40	1.20	1.20	1.40	1.30	1.30	1.20	1.20	1.20	1.20	1.20	1.03	0.94	1.04	0.93	0.92	0.93	0.91	0.92
Turkey	5.70	4.00	3.90	3.30	3.00	2.70	2.10	2.10	1.70	1.90	1.60	1.83	1.64	1.59	1.52	1.45	1.39	1.46	1.48
United Kingdom	2.60	2.50	2.40	2.40	2.40	2.30	2.50	2.40	2.50	2.60	2.70	2.47	2.40	2.17	2.27	2.17	2.06	2.15	2.12
United States	3.20	3.00	3.00	3.20	3.60	3.70	3.90	4.00	4.00	4.00	3.80	4.81	4.78	4.42	4.08	3.77	3.56	3.56	3.57

Source: own processing, NATO (1999), NATO (2010) and NATO (2018a)

Table 27 NATO Members' Equipment expenditure as percent of Defense Expenditure

Country	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Albania											22.50	15.7	13.4	14.4	16.3	16.7	8.92	8.01	6.96
Belgium	5.60	5.80	7.10	7.10	5.30	5.40	6.40	2.90	4.80	8.20	8.20	6.79	6.27	3.57	2.84	3.52	3.44	4.66	5.3
Bulgaria						8.90	16.60	14.10	24.00	21.40	14.20	15.4	6.33	3.68	4.52	1.03	3.47	9.15	29.5
Canada	14.70	12.40	11.10	13.90	13.60	16.70	11.80	11.80	14.80	13.00	17.90	13.8	9.67	8.31	11.2	13	10.5	10.6	19.4
Croatia											10.20	8.12	15.8	14.7	10.7	7.35	10.6	10.1	9.07
Czech Republic	15.90	22.50	20.30	17.50	19.50	15.40	9.30	14.60	10.10	12.90	22.40	12.4	13.3	14.8	9.49	6.53	11.8	6.7	11.1
Denmark	13.90	14.80	16.80	13.50	16.10	19.10	11.20	15.40	15.70	18.80	9.90	14.1	9.68	9.03	11.3	11	11.5	13.7	12.1
Estonia						13.30	11.90	14.50	23.70	10.10	17.80	11.9	10.1	13.7	14.5	22.2	12.8	17.9	19.2
France		18.90	19.40	19.10	20.50	21.40	21.30	22.80	21.40	21.00	27.00	30.2	28.2	30.6	24.5	24.6	25	24.4	24.2
Germany	13.60	13.50	14.00	14.10	13.80	14.80	14.20	15.00	14.60	17.10	17.60	17.6	16.4	16.5	12.7	12.9	11.9	12.2	13.8
Greece	19.40	17.80	15.20	13.10	10.70	7.60	15.30	14.90	10.50	16.40	27.90	18	5.86	7.47	12.1	8.17	10.4	13.5	15.5
Hungary	19.00	12.40	10.50	11.10	10.30	11.90	8.40	9.00	12.10	14.80	12.70	12.1	12.3	5.84	11.1	7.76	9.75	13.4	15.3
Iceland																			
Italy	12.20	14.30	10.30	12.40	12.90	11.00	9.10	7.20	14.00	12.70	11.30	10.9	11.7	8.87	12.5	10.9	9.72	19.1	20.9
Latvia						8.20	8.70	12.30	9.60	14.90	5.40	15.6	10.8	10.5	12.1	7.55	13.6	19.1	17.2
Lithuania						15.10	15.30	17.00	18.70	16.30	16.20	10	9.38	11.2	9.23	14.1	21.6	30.1	31.1
Luxembourg	3.40	4.60	12.10	6.80	7.40	11.10	11.40	8.70	6.80	25.10	28.20	34.5	21.9	17.1	14.6	22.6	33.3	30.1	33
Montenegro												3.66	1.73	4.44	1.32	7.46	5.43	4.46	8.2
Netherlands	16.00	17.00	16.70	15.90	14.90	16.40	16.00	16.80	19.10	18.40	17.60	15.7	14.4	13.4	12.6	10.7	11.2	14.1	16.8
Norway	23.50	19.40	21.20	23.70	21.80	24.20	21.10	19.40	21.40	22.60	19.20	18.1	17	17.8	18.9	21.2	22.5	24.1	25.5
Poland	9.70	8.80	8.80	11.10	12.40	14.60	14.60	18.20	18.60	13.60	15.10	18.1	16.1	15.2	13.9	18.8	33.2	21.6	22.1
Portugal	9.40	6.40	5.30	4.10	7.40	7.60	8.90	8.90	8.40	13.50	9.50	13.2	12.1	9.34	8.65	8.43	8.7	9.95	10.3
Romania						20.80	20.00	24.00	13.30	16.70	8.60	8.8	7.57	4.14	10.7	15.8	19.7	20.4	33.2
Slovakia						11.60	14.80	12.70	16.20	14.60	13.20	9.81	7.15	9.56	7.39	11.1	18.3	15.3	20.4
Slovenia						18.70	9.50	12.20	10.80	7.40	8.60	18	5.7	1.2	1.27	0.66	1.85	1.02	4.01
Spain	12.00	12.90	12.70	23.30	22.20	22.80	22.10	21.70	20.80	22.50	17.40	12.1	6.74	22.9	12.4	13.5	14.8	6.65	19.3
Turkey	27.50	28.30	33.00	31.50	38.30	36.30	29.80	34.40	24.50	27.40	17.50	28	24.6	21.2	26.9	25.1	25.1	25.6	30.4
United Kingdom	27.50	25.70	24.10	23.70	22.60	22.80	23.10	21.40	22.60	22.50	24.00	24.5	22	19.5	21.9	22.8	21.8	21.6	22
United States	24.40	21.90	25.70	27.40	24.50	24.90	24.50	23.80	24.60	26.00	30.00	24	27	27	25.8	26	25.4	25.1	28.4

Source: own processing, NATO (1999), NATO (2010) and NATO (2018a)

Table 28 NATO Members' 2017 Defense Expenditure per capita (USD) and NATO members' 2017 Real GDP per capita (thousands USD)

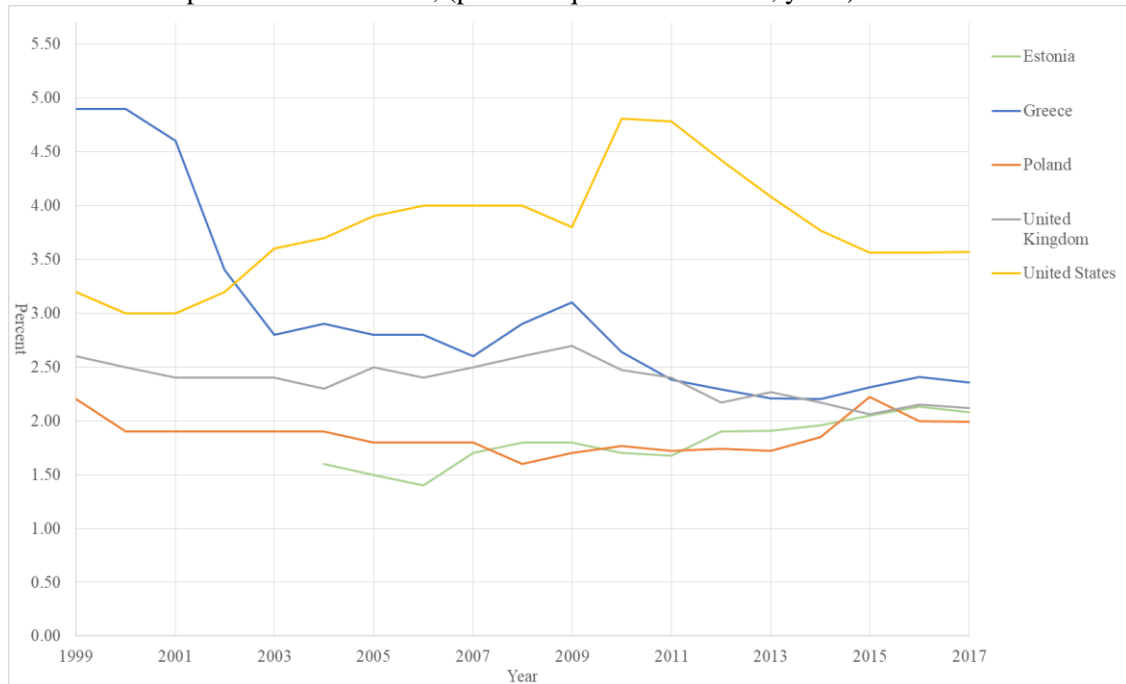
Country	2017 Defense Expenditure per Capita (USD)	Rank
Iceland	0	29
Albania	54	28
Montenegro	123	27
Bulgaria	128	26
Hungary	165	25
Croatia	190	24
Romania	193	23
Turkey	219	22
Slovak Republic	236	21
Czech Republic	239	20
Slovenia	251	19
Latvia	273	18
Lithuania	290	17
Spain	300	16
Portugal	301	15
Poland	309	14
Italy	391	13
Estonia	393	12
Belgium	415	11
Luxembourg	500	10
Greece	545	9
Germany	576	8
Netherlands	620	7
Canada	664	6
Denmark	720	5
France	760	4
United Kingdom	896	3
Norway	1,481	2
United States	1,896	1

Country	2017 GDP per capita (thousand USD)	Rank
Albania	4.9	29
Montenegro	7.8	28
Bulgaria	8.3	27
Romania	10.7	26
Turkey	14.8	25
Croatia	15.0	24
Poland	15.5	23
Hungary	15.6	22
Latvia	15.7	21
Lithuania	16.7	20
Estonia	18.8	19
Slovak Republic	19.9	18
Czech Republic	22.8	17
Portugal	23.1	16
Greece	23.1	15
Slovenia	25.6	14
Spain	32.5	13
Italy	34.9	12
United Kingdom	42.3	11
France	42.6	10
Belgium	46.2	9
Germany	46.6	8
Iceland	50.8	7
Canada	51.5	6
United States	53.1	5
Netherlands	53.7	4
Denmark	61.5	3
Norway	91.4	2
Luxembourg	108.8	1

Source: own processing, NATO (2018a)

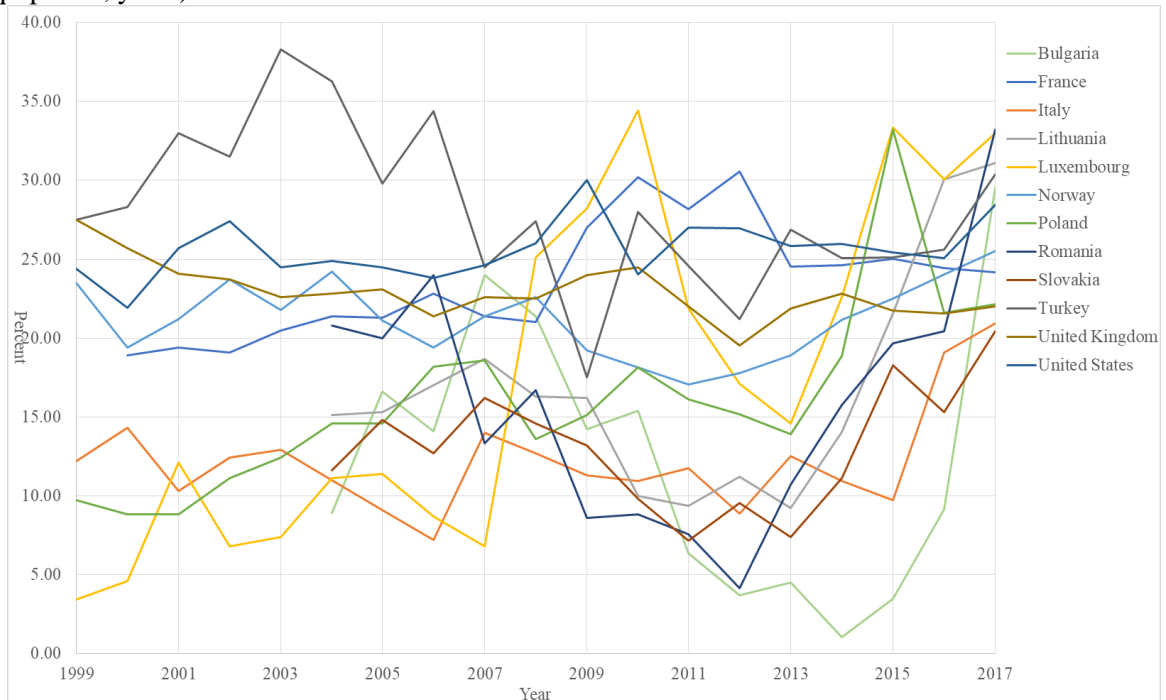
Appendix 3 –NATO Members reaching the main NATO goals

Graph 6 NATO Members reaching the 2 percent equivalent of percent GDP goal in 2017 as of their Annual Defense expenditure 1999-2017, (percent equivalent of GDP, years)



Source: own processing, NATO (1999), NATO (2010) and NATO (2018a)

Graph 7 NATO Members reaching the 20 percent goal in 2017 as of defense expenditure spent on major defense equipment 1999-2017, (percent of defense expenditure spent on major defense equipment, years)



Source: own processing, NATO (1999), NATO (2010) and NATO (2018a)