

T.C.
ANKARA YILDIRIM BEYAZIT UNIVERSITY
GRADUATE SCHOOL OF SOCIAL SCIENCES

IMPACT OF MILITARY EXPENDITURE ON ECONOMIC GROWTH OF AFGHANISTAN

MASTER'S THESIS

KHALILULLAH HASSANI

DEPARTMENT OF ECONOMICS

ANKARA 2020

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ANKARA 2020

APPROVAL PAGE

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PLAGIARISM

I hereby declare that all information in this thesis has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conduct, I have fully cited and referenced all material and results that are not original to this work; otherwise, I accept all legal responsibility. (05/05/2020)

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ACKNOWLEDGEMENTS

I would like to thank Prof. Dr. Erdal Tanas Karagol for full support throughout the providing and preparation of this thesis with all his unique and wisdom guidance. Also, I am thankful to Dr. Onder Ozgur for his cooperation and contribution at all part of my thesis specially in formation of the model. At last, I would like to thank all my honorable lecturers, my family for their support, patience, and encouragement.

ÖZET

Afganistanda Askeriye Harcamalarının Ekonomik Büyüme Üzerinde Etkisi

Bu çalışma vektör otoregresif modeli ve Granger nedensellik testi (1980) kullanarak 2004 ve 2018 arasında Afganistanın askerıye harcamasının ekonomik büyümesinin etkisini tahmin etmektedir. Bu modelde ekonomik büyüme bağımlı değişkeni olup askeriye harcama ve işsıslık bağımsız değişkenler olarak belirlenmektedir.

Bu çalışmanın bulgusu, 2004 ve 2018 arasında Afganistanın askeriye harcamasının ekononomik büyümeye etkisi olmamasıdır. Ayrıca, Granger nedensellik testinden ekonomik büyümeyi etkileyen politika değişiklikler askeriye harcamanın degişmesinin nedeni olurken askeriye harcamayı etkileyen politika değişiklikler ekonomik büyümesinin değişmesinin nedeni olmadığını bulunmaktadır (tek yönlü nedensellik). Ortak teste göre askeriye harcamayı ve işsızlığı etkileyen politika değişiklikler ekonomik büyümesinin nedeni olup işsızlığı ve ekonomik büyümeyi etkileyen politika değişiklikler ise askeriye harcamanın nedeni olmaktadır.

Anahtar kelimeler: Askeri Harcamalar, Ekonomik Büyüme, İstihdamlar ve VAR modeli.

ABSTRACT

Impact of Military Expenditure on Economic Growth of Afghanistan

This empirical and analytical study for the period of 2004-2018 estimates and considers the impact of arms expenses on economic growth of Afghanistan by applying the VAR model and VAR Granger causality (1980). The model is run by having the dependent(predicted) variable of economic growth and independent(predictors) variable of military spending and employment.

Ultimately, this analysis revealed that arm expenses does not have a significant effect on the economic growth of Afghanistan for the 15 years period from 2004-2018. And after running the Var Granger causality it revealed that if some policy changes accrue to the GDP or economic then it will cause the military expenditure (unidirectional causality) and policy changes to the military expenditure will not cause GDP. According to the joint test, it is seen that if some policy changes accrue to the employment and military expenditure so it will cause GDP, if some policy changes accrue to the employment and GDP so it will cause military expenditure.

Keywords: Military Expenditure, Economic Growth, Employments and VAR model.

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Abbreviations

ALP : Afghanistan Local Police

ANDSF : Afghan National Defense Security and Forces

ANP : Afghan National Police

ASFF : Afghan Security Forces Fund

ADF : Augmented Dickey Fuller

ARDL : Autoregressive Distributed Lag

AIC : Akaike Information Criteria

DC : Developed Countries

ECDO : Economic Cooperation and Development Organization

FPE : Final Prediction Error

WW1 : First World War

GDP : Gross Domestic Product

HQ : Hannan Quinn Information Criteria

LOTFA : Law and Order Trust Fund of Afghanistan

LDC : Less Developing Countries

ME : Military Expenses

MoD : Ministry of Defense

MoI : Ministry of Internal

NATFO : North Atlantics Territory Trust Fund Office

PPC : Production Possibility Curve

PPP : Purchasing Power Parity

WW2 : Second World War

SIPRI : Stockholm International Peace Research Institute

SIC : Schwarz Information Criteria

USA : United State of America

UK : United Kingdom

VAR : Vector Autoregression

WDI : World Development Indicators

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1.Introduction

This section of research will be involved of the introduction part in which foremost the background of the study, the aim and the significance of the topic will be discussed, and after that what other researchers say and done about the relevant topic and how the gap is found and illustrated will be explained and finally, all the sequences and consequences of the research will be explained.

1.1. Background of the Study

This empirical research is conducted related to the effect of the arm expenses on the economic growth of Afghanistan which is suffering war approximately more than 40 years, and a different portion of the budget is allocated for running and lunching the defense expenditure and military operation, it is a country which is going war for a long term and surrounded by terrorism and extremism so it compulsory order to allocate some portion of the budget for naturalizing the threats. There are already researches exist regarding the effect of the military and arms expenses on overall growth rate, the impact of arms expenses on less developing countries (LDC) and developed countries (DC) economic growth and individually, but never has been done any researches about the military spending impact on economic growth of Afghanistan. By having military expenditure how much the gross domestic product (GDP) and employment level is affected will be discussed.

Related to the effect of arm expense on growth rate of a country there are a different school of thoughts. Military Keynesianism claims the government must raise military spending for having boost economic growth. In the Keynesian school of thought, the Narayan and Singh (2007) believe that demand, purchasing power of parity (PPP), national output (NO) will be stimulated by increasing military expenditure and create positive externalities.

According to the Keynesian approach, aggregate demand will become high by making increasing defense spending and this demand increasing will be the reason for having output and employment to grow. Hence, arms expense will have direct impact on growth rate.

The Classical school of thought says arm spending and economic growth are related factors. This statement is established on the assumptions the arm expenses increases the level of private investment will be increased, internal saving decrease and consumption will go down due to less aggregate demand. It could be illustrated like following that as much arm expenses are increased that much the interest rate will be led to be increased, which private investment will be disturbed. In the Keynesian school of thought, the Narayan and Singh (2007) believe that demand, purchasing power of parity (PPP), national output (NO) will be stimulated by increasing military expenditure which attract the economic growth.

Both school of thought Keynesian and Classical justify that economic growth will accrue after having military expenditure but about the impact of arm expenses on growth rate of developed countries or developing countries no one of these schools specifies any clear option and there is different research related to that as done by Korkmaz (2015) about the Mediterranean countries which has negligible effect of the arm expenses on growth rate. The GMM method which has been applied to 90 countries as panel data over 1992-2006 by Chang et al (2011) which was low-level income countries the result claims that for the gathered of low-income countries military, arms expenditure cause negative growth rate. Research related five South Asian countries (India., Sri Lanka, Bangladesh Nepal and Pakistan) from 1987 – 2007 was done by Wijeweera and Webb (2011) by they help of panel con-integration, they concluded that 1% rise in the arms expenditure the real gross domestic product (GDP) will increase by 0.04% in which it is shown that arms expenses have a negligible impact on growth rate of these countries.

There is a direct association among growth rate and arm expenses in developed countries as a sample the United State of Americans economic has been affected positively in which research has been done by Masoud and Munadhils (2015) that by 1% rise in military and arm expenses, the economy has growth 0.59% which is significant.

As it has been illustrated that for high-level income countries or developed countries (DC) that arm expenses has direct impact on economic growth, the most influential and beneficial elements which create the positive associations between economic growth and military expenses is being the military producer, military tools exporter and military companies which is labor-intensive and for some middle countries there are direct association between arm expenses and economic growth which is very negligible, mostly the military export and import level of these countries are at equilibrium point that is why it does not change the economic growth as much and for low-level countries or less developing countries(LDC) there is an adverse or negative association between arm expenses and economic growth because of non-producing, less level of export, large level of military tools import and non-creation of employment. So conclusively the effect of the arms expenses on the economic growth of Afghanistan would be negative because of the non-producing, importing of a high level of military tools and non-creation of the employment level inside the countries but still it is unknown and needs to be confirmed the level of impacting.

Afghanistan is one of the military ammunition importers in which after the first world war (WW1) and second world war (WW2) from 1950-2018 imported approximately $15869 million and unfortunately there is no production and export so it must have affected the economic growth of Afghanistan at a huge level. Obviously at the absence of having any military and weapons producing companies inside the countries and continuously importing ammunition will affect economic growth. How much this budget which is allocated for the military expenditure affects the economic

growth and at which level this importing and non-producing of military ammunition affect the employment and overall economic growth will be investigated and analyzed.

1.2. Problem Statement

Clearly war and security are the main causes of arm expenses. Historically Afghanistan is suffering war more than 40 years which is really one of the long wars in the world and continued. As much war gets warm that much the unemployment will be created, military ammunition will be imported and the way for trading and investment will be limited which all will affect the economic growth.

As the budget for military expenditure is expanded that much the gross domestic product (GDP) and GDP per person will be affected. Here it will be shown how much these militaries and arms expenses affect the employment and economic growth in all over the country. Day by day the military expenditure budget is being expanded and war is being increased, the reason for military budget expansion and current war will be illustrated.

Military expenditure is affecting the economic growth of some countries positively and some countries are affected negatively so here it feels required to show that how this military expenditure is affecting Afghanistan's economic growth positive or negative and at which level it is being affected. If the economic growth is being affected positively so the budget could be increased if the budget is affecting the economic growth adversely so it would be suggested to cut some portion of the military budget. That is why it felt necessary to find the precise result and pave the way for the solution.

Pieroni (2009) says that endogenous growth theory make a basis for the association among the share of arms expenses and long-term growth rate forecasting an inverse hump-shaped relation. As it is obvious through the headline of the thesis that

impact of the militaries and arms expenses on economic growth will be considered and investigated so for these purposes the data is taken out through world development indicators (WDI), Stockholm international peace research institute (SIPRI) and some econometrics tools will be applied to find a precise and exact result for having an empirical analysis. The cutting or increasing of the military expenditures budget will depend on the result which will be taken out after applying some empirical methodology and analysis, as a result it is being felt necessary and compulsory to know the precise effect of the military and arms expenses on economic growth of Afghanistan.

1.3. Objective and Research Question of the Study

The essential purpose is to focus on the impact of the arms expenses on economic growth and how much employment level will be affected is considered and illustrated. The economic growth, military expenses, and employment elements will be taken as the variables in this research. For these purposes, the data is taken from world development indicators (WDI) and Stockholm international peace research institute (SIPRI) between the years 2004-2018 and will be applied to gain the objective of the study.

Although there will be expanded research related the current economic growth of Afghanistan, military expenditures budget, employment level, causes of having more military budget allocation, war and security barriers for investment but mostly it will be focusing on the following question:

a. What is the effect of militaries and arms budget expenditure on the economic growth of Afghanistan?

b. Does changes in policy of military expenses will be affecting economic growth in Afghanistan or not?

1.4. Significance of the Study

As it is already illustrated the impact of militaries and arms expenses on economic growth can be positive, adverse, and neutral, so in the case of Afghanistan it is not clear that is there positive relationship or adverse association between economic growth and military expenses. The most significant advantage is, it will be proved and shown that how does the arms expenses affects the growth rate of economic and how affect the employment level, is it positive, adverse, or neutral.

After clarifying the association between economic growth and military expenses it will be suggested to decrease or increase the military budget. If that portion of the military budget which is allocating for the military expenditure would be served for other purposes like schooling, reconstruction, or poverty decreasing how much will it affect the economic growth in Afghanistan will be found and analyzed here.

1.5. Study Plan

This study is organized as the first chapter is the introduction part which is involved of the background (of the study who offer information overall about the thesis), problem statement (which state questions), the goal of the study and question(who determine the main purpose of the study and state that why this research is done). The second chapter is a brief review of Afghanistan's arms expenses, economic growth, and employment which in economic growth part the causes and the barriers of economic growth are illustrated, in militaries and arms expenses parts the whole military expenses which are involved of goods and services are discussed annually and how much of the military budget is provided from Afghanistan's GDP and how much is prepared by the foreign donner is discussed and in employment part, the level of people who work inside the country and how much the percentage of this level is increased or decreased is discussed. In the third chapter again the all three variables economic growth, military

expenses, and employment will be discussed under consideration of some theories and school of thought with some hypothesis.

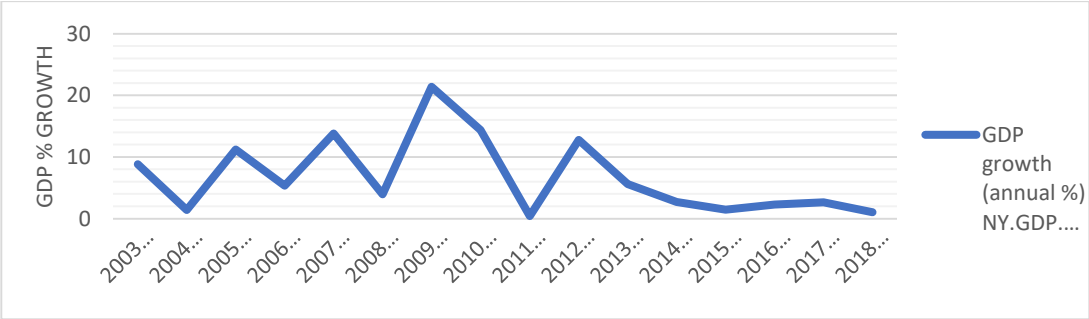
Chapter forth is the literature review part that reviews the literature regarding the effect of arms expenses on growth rate, impact of militaries and arms expenses on growth rate and employment in developed countries (DC), and less developed countries (LDC). The chapter fifth is the data and methodology part which discuss the main resources that data is taken and from which years the data's exist within this research, the log transformation, stationarity test by applying the ADF unit root tests, the lag selection by considering different criteria, the Vector Autoregression (VAR) model, VAR Granger causality, the impulse response and then the VAR model for Afghanistan is derived, at last part the variables are defined. Chapter sixth will be discussing the data and its sources which are taken from world development indicators (WDI) and Stockholm database (SIPRI). The seventh and last chapter which is involved of conclusion which will be noted after consideration of all the above parts and then after the interpretation of the result related to the topic there will be a policy provided to overcome and huddle the problem.

2. A Briefly Review of Afghanistan's Military Expenditure and Economic Growth

This chapter will be reviewing the military and arms expenses effect on the economy of Afghanistan but mostly the military expenditures, economic growth, employment level, and the elements which lead the economic growth and negative growth will be illustrated by the help of graphing in this chapter.

2.1. Economic Growth

Afghanistan is one of the countries which suffer war more than 40 years and it deeply affected the economy of Afghanistan but still struggling to create sustainable economic after facing all the long period of high insecurity and political uncertainty. Although geopolitically Afghanistan is controversial, but the economy is growing since 2000 up to 2019. The average level economic growth during these years was 6.83 percent while the minimum level of the growth was 0.43 percent and the maximum was 21.39 percent however if a country's economy is growing more than 5 percent per year at average so that is the substantial rate of economic growth as follow:

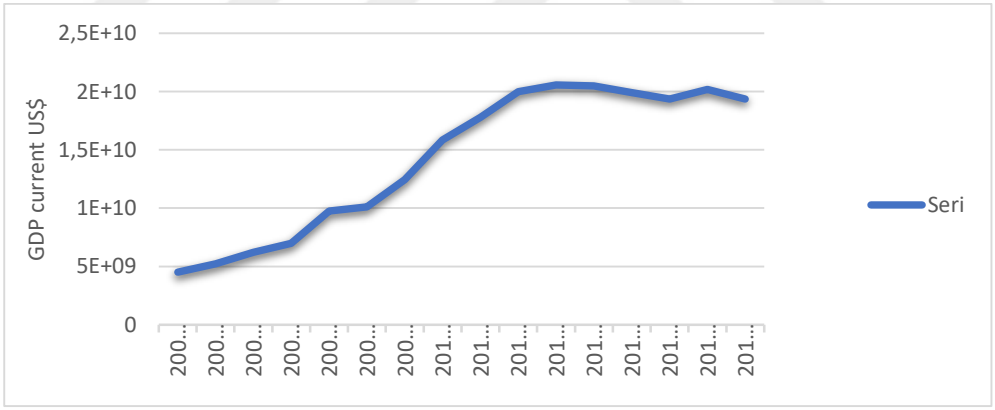


Sources: World Bank

Figure 2.1. Afghanistan's GDP Annual Growth as Percentage

As we can see that after 2001 the gross domestic product (GDP) of Afghanistan is growing up to now, and from the start of 2000 it was growing by some up and down percentage but in 2010 it is the pick level of economic growth in Afghanistan which was approximately 21.5 percent and after that again the economy growth is increasing but at a decreasing rate in which at 2018 it reached at 1.5 percent which is a very low level of growth.

Although the gross domestic product growth is increasing at a decreasing rate but overall, the (GDP) is increasing as time pass. In 2003 the gross domestic product (GDP) is 8.4$ billion which in 2017 reached 21.5$ billion (which is pick level) and finally, in 2018 it reached 19.5$ billion. Better could be explained by the following graph:



Sources: World Bank

Figure 2.2. Afghanistan's GDP at Current US Dollar

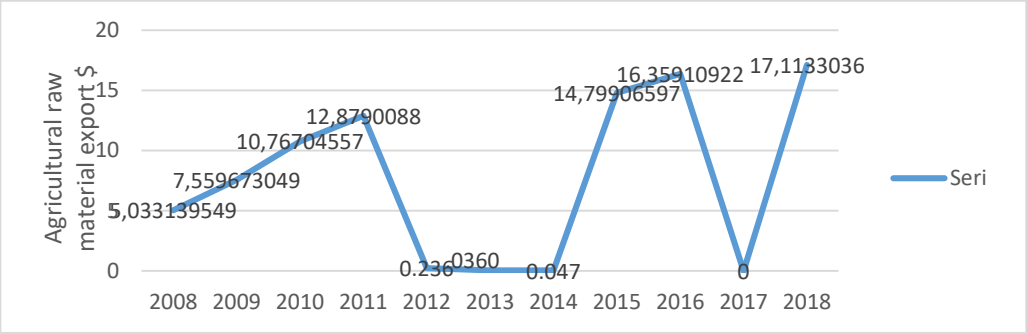
Although because of the non-existence of security and political stability in Afghanistan it couldn't grow as much significant but overall, the growing level was not quite stopped as well, here are some causes of economic growth and some causes of negative growth or slow growth which affected Afghanistan.

2.1.1. Causes of Economic Growth

Afghanistan has non-fuel mineral resources, involving both known and deposits of various minerals which just form copper, iron, sulfur, lithium, plutonium, and rare earth elements. In 2010 it was approximated that $1 T is identified in Afghanistan and some other report like afghan economy claims that it may reach to $3 T. The unknown deposit is iron, copper, cobalt and industrial metals like lithium, which Afghanistan has invited 200 global companies to extract its minds. The raw materials which are extracted are like copper, coal, gemstones, gold, iron ore, lithium, marble, petroleum, natural gas, and uranium, which exporting of all these elements as raw play important role for economic growth.

Afghanistan is the 150th largest export economy in the world, in 2017 the whole export was ($878 M) and import was ($5.08 B) which shows a negative trade balance of ($ 4.1 B). Except the mineral and raw mind material the top exports of Afghanistan are grapes($143 M), insect resins($102 M), fruits ($101 M), coal($59 M) and other nuts ($59 M) and its tope imports are wheat flours($419 M), armored vehicles ($331 M), petroleum ($258 M), raw sugar($248 M) and delivery trucks ($189 M). The tope Export of Afghanistan are India ($411 M), Pakistan ($392 M), Germany ($8.9 M), turkey ($8.74 M) and United State ($753 M). The tope import of Afghanistan is from Pakistan ($1.3 B), United State ($753 M), India ($630 M), Kazakhstan ($562 M) and China ($532 M).

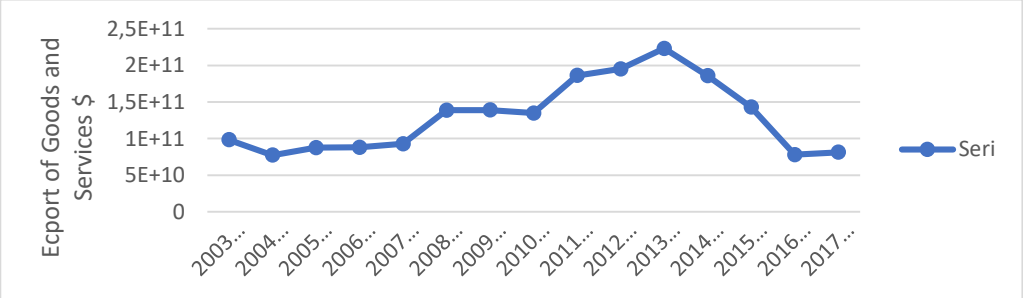
Agricultural Raw Material Export: After war ended in Afghanistan when it achieves some relative security and political stability then start the agricultural raw material exporting in 2008 which was approximately 5.1$ billion and after some up and down at 2017-2018 it reaches to 17.1$ billion which have the significant impact on growth rate of Afghanistan economic. 2012 to 2014 most of the agricultural area was not under the control of government that is why data is not available graphically can be shown as follow:



Sources: World Bank

Figure 2.3. Afghanistan's Agricultural Raw Material Export in Dollar

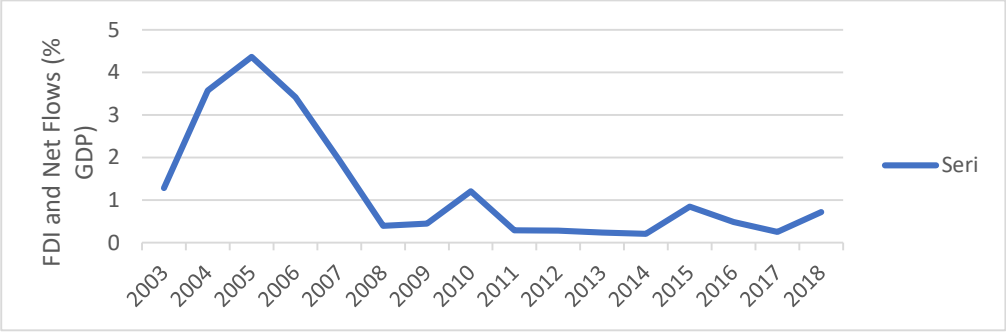
Export of goods and services: It shows the worth of all goods and market services which is provided to the rest of the world, and could be inclusive of the merchandise, freight, insurance, travel, license fees, transport, royalties and other services like construction, information, communication, business, financial, personal and government services, which have the significant impact on growth rate of Afghanistan economic. In which in 2002 overall the export of goods and services was 1.3$ billion which is 32 percent of the GDP and could reach up to 2.5$ billion. Graphically could be shown as follow:



Sources: World Bank

Figure 2.4. Afghanistan's Export of Goods and services in Current US $

Foreign Direct Investment (FDI): Over 13 years past the FDI indicator has fluctuated between $80 million in 2009 and in 2016 it was $769844, that recent value in 2018 for net outflows (BoP, current US$) and foreign direct investment is 0.7 percent of the GDP. In which according to the following graph it could be seen that some portion of GDP (up to 5%) is made of foreign direct investment, but recently it decreased. There are some countries that are investing in Afghanistan like Pakistan, India, Saudi Arab, China, USA … but because of no existence of security they are being collapsed.



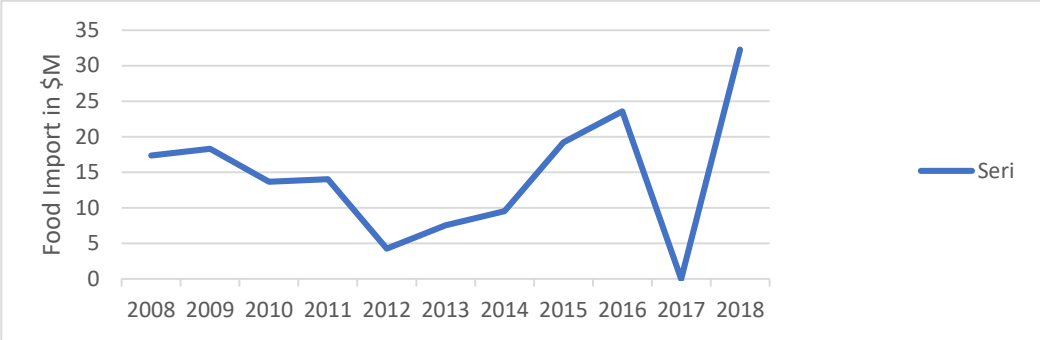
Sources: World Bank

Figure 2.5. Afghanistan's Foreign Direct Investment, Net Inflows % of GDP

There are some other elements which caused the economic growth of Afghanistan like; natural resources and minerals (which estimated more than $1 trillion), economical project (dams, air corridors for export and import, opening the borders for trading like lapis lazuli corridors).

2.1.2. Barriers of Economic Growth

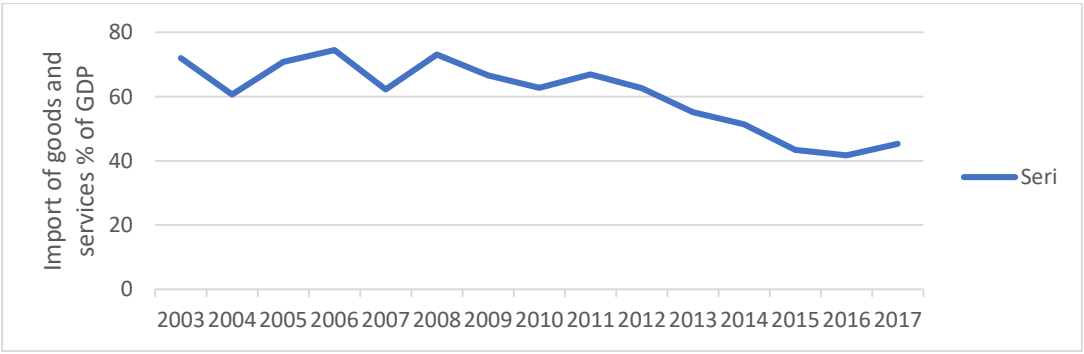
Importing products: Afghanistan is still one of the importer countries, its export is more less than its import, Non-producing position and importing is one of the elements which lead negative growth. According the following graph we can see that big portion of fund is used for importing and still it is increasing.



Sources: World Bank

Figure 2.6. Afghanistan's Food Imports as Percentage

At 2001 the import was completing 70 percent of the GDP and at 2017 it decreased to the 50 percent, so we saw that as much the import is decreasing that much growth is occurring that is why imports act as the barriers of economic growth. Recently Afghanistan start producing that is why it decreased the import and economic growth is occurring as we can see in the following graph that at 2018 the import of goods and services is decreasing up to 42 percent which is really significant.



Sources: World Bank

Figure 2.7. AFG's Import of Goods and Services as % of GDP

Security and war: Security and war are two elements that have a direct relationship with the economic growth of Afghanistan. As it is mentioned that more

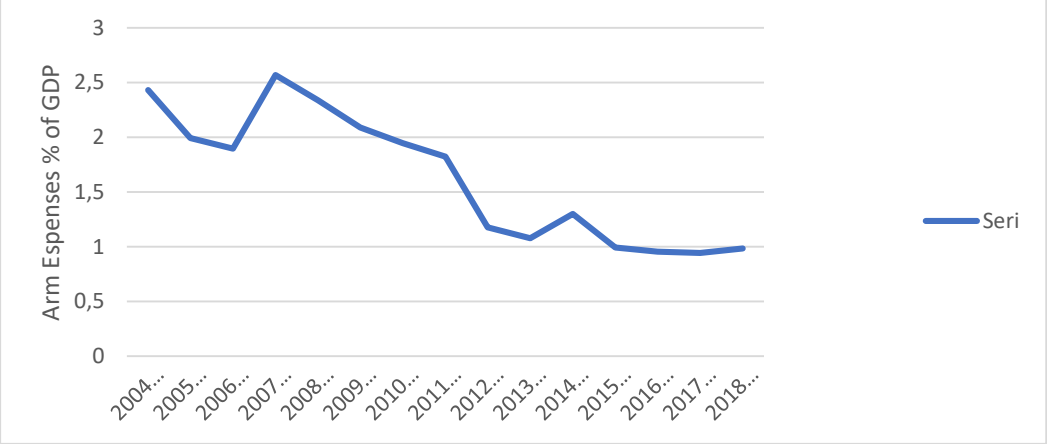
than 40-year war is continued in which still more than 20 terror groups are active over there, during these years it lost a lot of infrastructures, building, labors, military ammunition, etc. which made down the economy to zero. And still the existence of terrorism and nonexistence of security in provinces of Afghanistan made the way restrict to investors. Politically Afghanistan is unstable, for having economic growth a state must be with stable policy, because having war couldn't keep the policy stable which leads to the scaping of investors and hurt economic growth.

Landlocked location: Afghanistan is a mountainous country which is landlocked and no way to have a seaport, which creates disaster and made Afghanistan under the command of the neighbor countries, in this case, you will not be able to have access with the world market and you have to export cheap and import expensive which made the economy worse and worse. This situation hurt the economic growth of Afghanistan till 2017 but recently there are some alternative ways like Chabahar port which connect Afghanistan with India and lapis lazuli which first connect Afghanistan with Turkmenistan then Russia and turkey which could be connected with all European countries. At the four-part of Afghanistan, south, north, west, and east the air corridor is also activated in which the export and import are being done and, one direction of China's one belt one way which is called silk way will be crossing through Afghanistan which is hope full and open the ways for having export and import. So, after consideration of all that it becomes clear that landlocked problems are not capable to hurt the economic anymore.

Instability: One of the other factors which play a role in economic growth is the stability in a country but unfortunately it is more than 40 years in which Afghanistan is not stable politically who create a lot of disasters and financial crises inside the country and affected the growth of a significant level.

2.2. Military Expenditure

The main cause of military expenditure is the existence of war and the non-existence of security, which affects the routine life of people. Unfortunately, this scourge kept its existence for more than forty years in which a big portion of the fund is allocated for keeping it off and silent. In 2004 the 2.5 percent of the GDP was allocated for the military expenditure and in 2018 this amount decreased up to 1.1 percent. according to the following graph, we can see that after 2004 the portion of the GDP which was allocated for the arm expenses is decreased.



Sources: World Bank

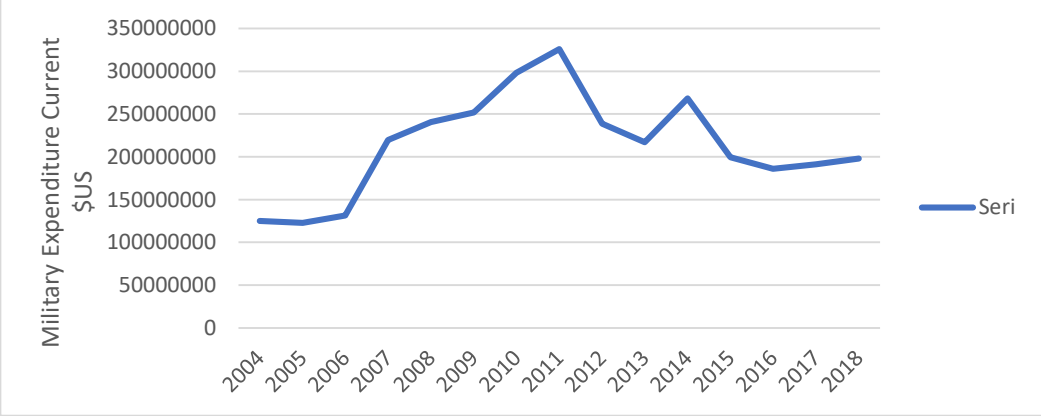
Figure 2.8. Afghanistan's Military Expenditure as percentage of GDP

But mostly Afghanistan's defense budget is relying on international funding which congress increased the annual budget for Afghan security forces fund (ASFF) from $3.9 billion at the beginning of 2015 to $4.9 billion up to 2019 and this budget could be involved of the sustainment, equipment, training and infrastructure cost.

The total amount which is required to financially support the Afghan national defense security and forces (ANDSF) structure is ($6.0 B) year base funded by a contribution from the United State Afghan security forces fund (USASFF), the

Afghanistan government. The law and order trust fund of Afghanistan and the North Atlantic territory trust fund office (NATFO). In 2018 Afghanistan security forces fund (ASFF) appropriate totals ($4.667 B) involve ($3.633 B) for the defense ministry (DM) and ($1.034 B) for the internal ministry (IM). The government of Afghanistan provides about ($500 M) primarily for food and subsistence and the remaining amount of ($789 M) of Afghan national defense security and forces ANDSF costs will be funded by the international supporters and donors.

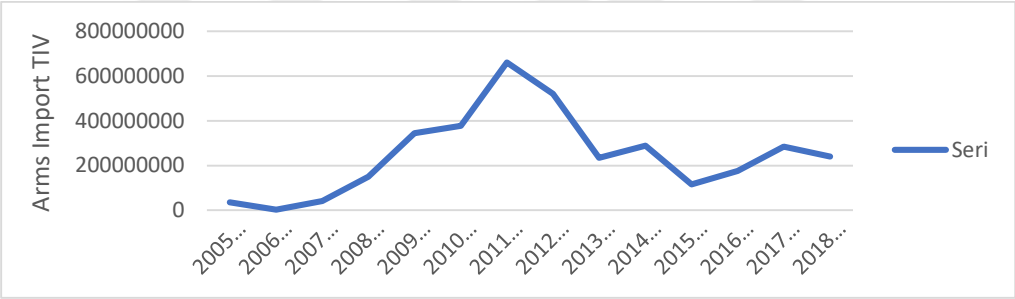
In 2014 according to the Stockholm database (SIPRI) approximately 23 countries have doubled the military expenditure over the last ten years. Paygi and Watson (2014) write Afghanistan has increased its military and arms expenditures by 577 % from 2004 to 2013. Afghanistan spent $770 million on its military in 2012 which is approximately 3.5% of the country's current GDP. This budget was allocated for Afghanistan security forces fund supports which is up to $352 thousand. Composed of up to 195 thousand Afghan national armies (ANA) and 157000 Afghan national police (ANP), and up to 30000 Afghanistan local police, total overall of 382 thousand. So, overall, according to the following graph we can see that military expenditure is increasing.



Sources: World Bank

Figure 2.9. Afghanistan's Military Expenditure in Current US Dollar

Afghanistan is one of the importers of the arms with zero export, in which its import got increasing after 2001 up to 2011 which is the high level of arms import in past two decades and again it starts decreasing up to 2018, although in short-run there is some up and down for long run the arms import is increasing which affect the economic growth adversely because if a country is just importing there is two side effect first you are not producing of that to export and secondly at the absence of producing and just importing unemployment will be created which is again bad news for having economic growth. It is about more than 18 years that all the military expenditure of Afghanistan is being paid by the outside and foreign donners these expenditures are involved in different types of ammunition like military goods and military services.



Sources: World Bank

Figure 2.10. Afghanistan's Arms Imports (Trend Indicator Value)

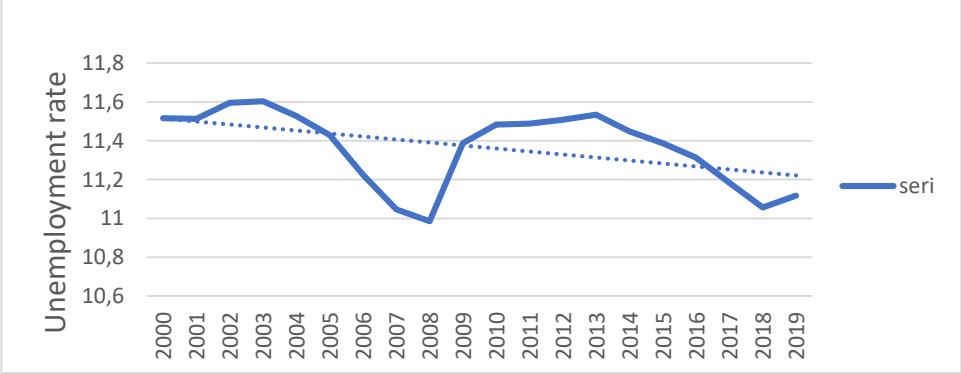
2.3. Employment

Employment is one of the other elements which is directly related to economic growth. It can be grown by having more production, more export, less import, no corruption, and no war but unfortunately, because of war exists in Afghanistan it couldn't have some significant increasing level, clearly, at the existence of war, there would be no production, no export, existence of corruption and huge volume of importing which cause negative growth and unemployment.

Military expenditure affects the employment but it differ and depend on countries, like United State which military expenditure is affecting the economic growth positively and create employment but in Afghanistan, it affects the economic growth negatively and does not create employment that is all because the United State is the producer and exporter of arms (which create employment) and Afghanistan is not producing and importing the arms (which do not create employment). So, we can claim that military expenditure does not create employment in Afghanistan.

This war and high level of expenditure created unemployment and poorness in Afghanistan which in 2007 the poverty level was 33.7 percent, in 2011 it was 38.3 percent and in 2017 it was 54.5 percent which is really disaster and crisis. Historically it is proved that as much the military expenditure increased that much the unemployment and poverty rise in Afghanistan.

The unemployment rate is fluctuating with a very minor level in Afghanistan which in 2000 the unemployment rate was 11.5 percent in 2010 it was 11.4 percent and in 2018 it is 11 percent. The following graph show the fluctuating of unemployment during the passage of time, unemployment is decreasing it is not very significant.



Sources: World Bank

Figure 2.11. Afghanistan's Unemployment Rate

3. Theoretical Framework

In this chapter the theory related to the topic will be studied. In which there will be a discussion of the theories related to economic growth and some say about the military expenditure and employment. Afterward the theories relevant to the effect of the military and arm expenses on economic growth and some hypothesis which is a claim of study will be explained.

3.1. Economic Growth and Military Expenditure

3.1.1. Economic Growth

Economic growth is the increase of the inflation-adjusted market value of the goods and services which is produced by an economy over time. The economic growth could be measured through the increasing rate in real GDP which is shown by production possibility cure (PPC).

Martin (2001) believe that the following elements will be determining the economic growth of a country.

1.Education, human capital, and physical capitals accumulation.
2. Distinction of institution favorable of the economy.
3. Free movement of technology, capital, ideas, free flows of information and foreign investment.

One more theory about economic growth by Lewis (1954) is developed which mostly he emphasized with poor countries' problems but meanwhile by having rich labor forces. Lewis model assumed that keeping down the level of life in a short period, during this period the savings which are gained will be increasing the stock of the capital that in the long period this procedure will be leading the income growth which

causes economic growth. So, the Lewis model illustrates the differences among the countries in the short run as they try to equalize the income level for the long run.

One more theory that supports Lewis's theory provided by the Kuznets (1955) which is called Kuznets's curve. Some empirical analysis justifies the existence of economic disparities. Kuznets believe in a direct association among dynamics of economic growth and the making rise the share of the urban population in total population.

So, after that, Wozniak (2008) also recommends that the economic growth model can be elaborated according to the timing criteria. He believed that model for long period are used to clarify the way of stable growth which characterize a path that economy should grow.

The both school of taught Keynesian growth models and Classical growth model believe by different views as follow:

Keynesian growth models believe that economic growth (for long-term) can be traced through the relations between saving, investments, and the level of output. The Harrod-Domar model which was used before the neoclassical model both of this authors Harrod (1939) and the Domar (1946) developed the model independently and uses two concepts from Keynesian economics which had to believe on multiplier and accelerator of investment and the importance of savings(S) and investment (I) was as the central line in the work of Harrod and Domar. Related to the economic growth the most important neoclassical growth model which is called the Solo-Sown model or the exogenous growth model tried to illustrate the long-run economic growth, the exogenous change is unexplained by the model and from outside to the model. Neoclassical growth models try to find a brightness of long-run economic growth by looking at capital accumulation, productivity, population growth, and technological progress.

Adam Smith believed that the economy is the wealth of nations linked with the progress of the output of production factors (labor, land, and capital) which the increase in the size of capital and growth of the labor productivity are tried to be reflected. Mostly the population growth is emphasized which lead to the rise in the share of labor to use for the material production, for geographical discoveries which contributed to extensive growth.

View of Malthus (1766-1834) related to growth rate of economic explore that population growth and production increases turned to be discouraged. From the Malthus point of view in case of proportions between population growth and means of subsistence remains, when the growth of the population is exponentially, and the means of subsistence grow arithmetically, we will face the forthcoming deficiency of the earth and therefore struggle for limited resources, the expansion of wars, hunger, disaster, mass diseases and so on.

Rostow (1961) believed that world developed countries could grow after passing the following five stages.

1. Traditional community: This is an agricultural economy of farming subsistence that is traded.
2. Preconditions for take-off: agriculture get more mechanized so in this case more of output is traded.0
3. Take off: producing industry assumes high importance and the number of industries remains small.
4. Drive to maturity: industry becomes more diverse and growth spread over the countries.
5. Age of huge consumption: output level grows and enabling increased consumer expenditure and growth is sustained by the expansion of a middle class of consumers.

3.1.2. Military Expenditure

The military expenditure is also known as the defense budget that is the amount of the financial resources which is going to be allocated by a country to maintain and raise the military forces or required method for the defense object. The different school of thought provides its own theory related to military expenditure as follow:

According to the new Classical theory, the military budget and spending can be considered as public goods. The new classical theories believe that the government will be acting as the agent to maximize the societies welfare by taking the name of the security benefit, the trade-off, and opportunity cost between civil spending and military. And this theory is mostly being criticized by its assumption which says that the government act as the rational agent. Feder-Ram (1986) which is mostly focusing on impact of the arms expenses on the growth rate in economy of the developing country through the export effect to a cross country study. Again, this model is criticized because the military and arm expenditure are represented through the single explanatory variable.

According to the Keynesian theory, if there is ineffective aggregate demand so the military spending will be increasing the country's output. Faini et al (1984) says military spending can increase the growth through the increase in investment, utilization of the capacity, and profit. This theory is again criticized by taking the name of demand-side did not mention the supply side and the production.

According to the Marxist theory, arms expenses and budget are necessary for the development of the military industries and believe that such type of spending enables the government to control the profit and wages in case of underconsumption. It also can be possible which the military budget may have a different effect at different times. Baran and Sweezy (1966) say that military expenses are looking important in

overcoming and handling realization crises and allowing the surplus without increasing wages or salary to keeping the profits. Although there are some scholars who had believed that none of the other governmental departments can fulfill this role. While extremely such an approach has been impressible and inspirable in economic growth literature, empirical mission within this approach has tended to be constrained to developed economies.

Smith (1977-1980) explain the association among economic development and arms expenses is controversial. Statistically, from organization for economic cooperation and development (OECD) there are some evidences which claims that militaries or arms expenses has an indirect impact on capital forming and most significantly reduce the growth rate.

Benoit (1973-1978) says that in contrast of that in less developed countries (LDCs) the statistical evidence claims the adverse that arms expenses and growth rate are associated directly, but there are some more other articles and researches after 2001 which claims that in developing countries as much the military expenditure increase in that much the economy will be affected negatively and adverse of this situation in developed countries as much the military budget increase that much the economic growth will accrue. Related to the arms expenses and growth rate, the association among all is clarified which theorized that arms and defense expenses can be relevant with direct impact or negative impact or can be insignificant (irrelevant) without any impact to the economic growth which is explained through the following sample of literature:

Kaldor (1976) made a research of 40 least developed countries for 1963-1973 and generated the coefficient of -0.18 between arm burden and economic growth which is not similar with the result of current research, the reason can be the non-productivity of military ammunition and importing of that while for Afghanistan the reason can be non-dependency and allocation of military budget.

Payne and Ross (1992) also lunched the VAR model to test that is there any causal association among arms expenses and growth rate of economic? The empirical result claims that no causal association could exist with arm expenses and economic growth, same as current research, the reason can be non-allocation of military budget from GDP or irrelevancy of both elements.

Cypher and Pivetti (1992) launched a research-related economic growth and arm expenses in which that arm expenses are enhancing economic growth. which is quite opposite to current research and the reason behind can be the interdependency of military expenditures and economic growth with each other.

3.2. Employment

Employment cannot be defined simply that holding a job for which a wage is paid or the operating of one's own business. It is the relationship between two party's employer and employee in which the work will be paid.

And there is a different statement by the scholars, the Keynesians theories regarding employment and unemployment were considered through the demand side of the model that is why his theory is known as the demand-oriented approach. Keynesians school of thought believed that employment depends on effective demand level of the people in-country and unemployment is attributed to the deficiency of effective demand. The Keynesians school of thought is a short-run theory in which there is no variability of the population, technology, population, etc., but there some criticism related to the Keynes theory for none considering the employment in long term.

The classical school of thought believes that the equilibrium level of income is appointed by the factor of the production, which means the classical theory mostly neglect the demand side and emphasized the supply side and this supply -oriented

approach to employment and income was based on certain assumptions. There is always full employment of resources and the economy will always remain in an equilibrium state.

Regarding employment the new theories are concerned which is mostly related to the technology, there are different beliefs, that technology will create employment but some economist like David Ricardo and Karl Marx which mentioned the technological unemployment, they believe that as much the technology increase that much the unemployment will be created because on behalf of labor the machines will be working which automatically the unemployment will be created.

Ricardo (1951) illustrate the idea, entertained through the laboring class, that for their interest machinery employment are frequently detrimental, is not established on error but regarding the correct principles of political economy looks conformable. The technological unemployment were as a concern for David Ricardo's and Karl Marx to appear as a common trait of capitalist societies over period of time, after that just machine will be working and there will not be anything to do by labor.

3.3. Hypotheses

Hypothesis 1: Military or arms expenses can have a direct impact or adverse effects on economic growth or may have no impact, it differs from country to country. Hou and Chen (2013) completed the empirical investigation related to the effects of the arm expenses on the economic growth of developing countries, for gaining any specific conclusion 35 developing country at the period of 1975–2009 is taken in which the result was a negative association among military expenses and economic growth, it means as much the military expenses is increased that much the economy will have negative growth. But still, there is one complexity among these 35 countries which is taken that have an insignificant relationship.

Ali et al. (2014) between the period of 1953- 2010 has done the research and prepared its article related to the arms expenses and growth in China to find the relationship that does arms expenses rise economic growth or else, the result is changed if the economy is growing faster so the effects of arm expenses and budget on economic is faster and vice versa if the economy is growing slower than there is a negative relationship.

Feridun et al. (2011) conducted related case of North Cyprus to find the causal association among the economic growth and defense which data is taken from 1977 to 2007 and (ARDL) approach is used and the result suggests, from arm and budget expenses to growth rate of economic there is a strong positive unidirectional causality running.

So, it is seen that in some countries the military expenditure has positive effects, and, in some countries, it has indirect impact on growth, and it depend to countries.

Hypothesis 2: Military expenditure can have a negative impact on employment in developing countries. Korkmaz (2015) lunch an investigation for the period of 2005 to 2012 about 10 Mediterranean countries related to the effect of arm and defense expenses on growth and unemployment, according to the analysis results if the budget defense affects the economic growth of countries negatively so it will increase unemployment. It is found that mostly those countries which are the importer of the ammunition and not producing and exporting will be faced unemployment and this situation comes true with the less developing countries. At the absence of the production so the importing will be done easily, and no employment level will be created which will have an indirect effect on growth and really hurt the employment level.

Hypothesis 3: Military expenditure and employment both cause economic growth (affect economic growth positively in most of the developed countries). And United State of Americans economic has been affected positively in which research has been done by Masoud and Munadhils (2015) that by 1% increase in arms expenses the economic has growth 0.59% which is the significance.

As it has been illustrated that for high-level income countries or developed countries (DC) there is a direct impact of the defense budget on growth, the most influential and beneficial elements which create the direct association among economic growth and military expenditure is being the military producer, military tools exporter and military companies which is labor-intensive and for some middle countries there is a positive or direct association among military expenses and economic growth which is very negligible.

4. Literature Review

The literature review part of this thesis is organized by reviewing the existing literature of the association among the military expenses and economic growth overall and country level. Although there will be more focus on the main variable of the study like military expenditure, economic growth, and employment. The literature review related to the military or arms expenses and economic growth will be illustrated in the sequence of country level, region level, developed country (DC), and less developing countries (LDC) with all its determinant and variables. Recently there is a lot of research and investigation which is done regarding the impact of arms expenses on economic, and these studies are categorized into three part in which the first part is analyzing the impact of arms expenses on economic at the aggregate level, the second part will be studying the impact of arms expenses on economic growth and employment of developed countries (DC) and the third part will be reviewing the effect of the arms and budget expenses on employment and growth rate of economy in developing countries.

4.1. Effect of Arms Expense on Economic Growth

Luca (2009) tested arms expenses and economic growth associations which included the effect of the share or part of arms and a civilian component of government expenses in an economic growth model with endogenies technology and empirically the hypothesis of the nonlinear effect of militaries expenses on economic growth is considered. Multi metric sectional correlations are in line with an empirical conclusion and the durability of estimations is tested by using a non-parametric method. In countries with a huge level of military or arms burden the adverse association among the military and arms expenses and economic growth is forecasted by theory becomes important and valuable after including a stand-in for re allocative impact in the growth model. Luca after testing concludes that it is confirmed which the association among

the military expenses and economic growth might contain nonlinear without the hypothesized by the traditional growth model is not involve of the appropriate control variable. So, as mentioned above, the non-parametric approach looks useful tools for the next research to prevent the uncertain misspecification in the economic growth model.

Dunne and Tian (2015) on a huge balanced panel considered the effect of arms expenses on economic growth, which uses an aggressive panel data method and exogenous growth model over the period of 1988-2010 for 106 countries. Mostly this paper is focused to examine the non-linearity and the possibility of group heterogeneity. For all the countries the model is tested in the panel and concluded that military expenses have an indirect effect on the long run and short run. The considered factor is a different level of income, natural resources, conflict experience, aid, and openness. Estimation for various groups is stable with those who provide strong and logical backing for the statement that arm expenses have an indirect effect on economic growth. Although there is some result who claims that for specific countries there are no serious and significant impact of arms expenses on economic. Dunne and Tian seem are like that they strongly support that military or arm expenses have an adverse effect on economic growth. But some countries vary for instance low aid recipient, none-fuel and natural resources abundance countries exhibit no effect of arms expenses on growth and no evidence and prove exist to shows the significant direct affect among the all variables.

Alptekin and Levine (2012) provided mega analysis to consider 32 analytical studies 169 estimates of the impact of arms expenses on economic growth and formulated four hypotheses. The first hypothesis (H1) military or arms expenses reduce economic growth, second hypothesis (H2) arms spending lead to economic growth in developing countries (DC), third hypothesis (H3) military and arms expenses has a direct effect on growth rate of economic and fourth hypothesis (H4) the non-linearity between arms expenses and economic growth. According the meta-analysis, the first

hypothesis (H1) and second hypothesis (H2) are rejected but the third hypothesis (H3) and fourth hypothesis (H4) are being supported. The third hypothesis is supported by the developed countries (DC) and the fourth hypothesis suggests that there can be different circumstances in which the economic growth will be affected positively after arising from an increment in arms and budget expenses could eventually be dominated by the opportunity cost of diverting resources far from the civilian sector of the economy.

Yildirim et al. (2005) for the period of 1989 to 1999 by using the cross-sectional and dynamic panel estimation technique empirically examined the effect of arms expenses on economic growth related to turkey and eastern Asian countries, it is tried to find the association among the economic growth and arms expense. This research paper claim that conclusion of this investigation indicate that arms expenses causegrowth in turkey and the factor of productivity differential are positive which claims that civilian area is less productive than defense sector reason is that defense sector in the middle east uses high and top-level technology compared with rest of economies.

Yakovlev (2007) investigated the interaction of non-linearity in the context of Solow and Borro growth model which was commended by Dunne et al (2005) using random effects, fixed effects and GMM estimator which consider the growth effects of the arms trade, military expenses and its synergy from 1965-2000 in a balanced panel of 28 countries. Pavel Yakovlev finds which high military and arms expenses and net military exports individually cause to low level of economic growths, but higher arms expenses are less indicator to growth for net arms exporter countries. According to the Solow growth style arm expenses are adversely associated to economic growth, the association between economic growth and net military exports are adverse and their synergy is directly associated to economic growth. Which mean that if a country is a net arms exporter so high military expenses are less hurting to growth or we can

conclude that for net arms exporter the more arms expenses is a good sign for the economic.

As at the first part of literature review, the impact of militaries or arms expenses on economic growth is illustrated at an aggregate level and according to the result of literature which is reviewed the military spending budget can have a positive (direct) impact or negative (adverse) impact on economic growth but it differs country to country and region to region so in this case, it is felt necessary to review the literature regarding the impact of the arms expense on growth separately, so the literature related to the effects of arms expenses on the growth rate of economic of the developed country (DC) and less developed country (LDC) is going to be reviewed, recommended and concluded.

Table 4.1. Effect of Arms Expense on Economic Growth

Author	**About**	**Method and Observations**	**Finding**
Dunne and Tian (2015)	effects of arms expenses on growth rate of economy	22 years observation from 1988-2010 Exogenies growth model and method of dynamic panel data	For the short run and long run the arms expenses have an indirect effect on growth rate of economy.

Alptekin and Lecvine (2012)	Effect of defense expenses on economic growth.	Different observation for each analysis. Meta(mega) analysis to consider 32 empirical studies	1-Military expenditure do not reduce economic growth. 2-Military expenditure do no lead economic growth in less development countries (LDC). 3-Military expenses have direct effect on economic growth. 4-Non liner effect of both factors
Yildirim et al, and Öcal Sezgin (2005)	Effect of arms expenses on growth rate of Turkey and some Asian countries	10 years observation from 1989-1999. Cross sectional and dynamic panel estimation technique	Military and arms expenses in Middle eastern countries and turkey leads Economic growth and factor productivity differential are positive
Yakovlev (2007)	The growth effects of arms trade, military expenditure	35 years observation from 1965-2000. Random effects, fixed effects and GMM estimator for balanced panel of 28 countries	Higher arms expense and absolute arms exports create lower growth but if a country is an absolute exporter of arms, so the higher arms expenses are less appointer to growth

4.2. Impact of Military Expenditure on Economic Growth and Employment of Developed Countries (DC)

As it is explained that association among the military expenses, economic growth and employment could differ around countries and regions so in this following part the effect of arms expenses on economic and employment will be illustrated toward the developed countries(DC) or first world countries, again inside the first world countries the effect of arms expenses on economic growth and employment will differ which some literature is done, related that will be reviewed.

Karagöl et al. (2014) conducted research related to the impact of arms expenses on the economic growth of 11 developed countries (USA, Germany, Belgium, UK, Italy, Canada, Norway, Denmark, France, Netherlands, and Portugal) from 1980-2007. By the help of the Granger causality test, it is found that arms expenses is a factor in economic growth or it justifies the hypothesis which claims that defense expenses by developed countries directly play role to their economics and long-term association exists within economic growth and military expenditure according to the Pedroni cointegration test

Korkmaz (2015) for the period of 2005-2012 lunched an investigation) related to the effect of military and arms expenses on economic growth and unemployment of the 10 Mediterranean countries (Spain, Bosnia-Herzegovina, Croatia, Egypt, France, Greece, Israel, Italy, Turkey, and Slovenia, according to results if the military or arms expenses affects the economic growth of countries adversely so it will increase unemployment. It is found that mostly those countries which are the importer of the ammunition and not producing and exporting will be faced unemployment and this situation comes true with the less developing countries. At the absence of the production so the importing will be done easily, and no employment level will be created which will have an indirect effect on growth rate of economy that really hurt the employment level.

Masoud and Munadhils (2015) launched research through Autoregressive Distributed Lag (ARDL) approach which investigated the association between arms expenses and economic growth of United State of America (USA) by using the for the period from 1970-2011. The founding claims that a negative association between economic growth and arms expenses. Masoud and Munadhils, results suggest that the United States of America (USA) economy military expenditure can play a non-productive role. It does not mean that it is not motivating the economy growth for the long term. The current situation is looking crucial then more increase is the cost of growth in the long period.

Gerace (2002) from 1951 to 1997 lunched a research on the growth rates of the military(arms) and nonmilitary(nonarmy) American government expenses and GDP. The results claim which nonmilitary expenditure moves counter periodic cyclically with real GDP growth rates, but arms expenses do not. This research could not find support for countercyclical link among the growth rates of United States arm expenses and gross domestic product and there is no actual prove to support for the hypothesis that arms expense and budget are adversely related to the GDP growth rate economy.

Dunne and Smith (1984) launched research that was eager to find the economic consequence of reduced United Kingdom (UK) military expenditure as the budget which was allocated for military expenditure was reduced in 1983. Dunne and Smith found military spending imposes and accommodate an extraordinary burden and huge levels over the post-war certainly helped to the low rate of growth in United Kingdom (UK), reduction in military and arms expenses to 3.5 percent of GDP, matched by programmed to leave total public expenses without changes, would result in an absolute increase in employment of about 100 thousand, so it could be claimed that in the UK as much the military budget is decreased that much the employment will be created.

Diebolt and Jaoul (2006) did research to find the association among the military expense, economic growth, and education in Japan. For gaining such purpose, the Granger Causality test is used. The conclusion shows that all the spending affected the economic growth in Japan and military spending plays more central and vital role for both economic and social levels and spending on education can be examined as one of the driving and crucial power of the growth rate in Japan, chronologically, japan looks to have progressed in education sector and military to lead a specific level of growth, and if the military expenses lead economic growth so we can add that it is creating employment as well in japan so because of having a direct association among military expenses, economic growth and employment the budget will was allocated to the military and arms expenses is increased as previous years.

Bremmer and Kesselring (2007) lunched a test to find out the impact of arms expenses in the economic growth of North America (Canada, Mexico, and the US), and the data set for 3 countries are involve of 43 observation between 1996-2005. After increasing the military expenditure, the nominal GDP in Canada and Mexico is increased and employment is created, but in case of US as much the military spending in increase that much the growth in nominal GDP is reduced and unemployment created but long run the impact is not same like short run.

Satya (1996) between the period of 1962-1988 related to 18 OECD countries estimated three models to find out the association among military expenses and unemploymentwhich used the VAR (vector autoregression model) and Granger Causality Test. One of the conclusions was that association among military expenses and the unemployment rate is not uniform across the countries. Military expenditure has a favorable impact in Australia and Germany while it damaged the employment rates situation in the case of Denmark it damaged the employment rates situation. In the UK, the defense expenditure act as a motivational tool to change the unemployment rate. With Canada, USA, Italy, Japan, Netherland, Spain, Austria, New Zealand, Sweden there is no causal association among military expenses and employment rate.

Mert and İlhan (2013) launched research and the goal of this investigation was to find out the association among military and arms expenses and economic growth among the superpower countries of the world by using the Toda Yamamato method and ARDL approach between the period of 1973-2011. Mert and İlhan's empirical indicate that in case of USA, UK, Russia, China, Italy, South Korea, and India there is a long period association exists among military expenses and economic growth and there could be two reasons that why there is such a long association exists among military expenses and economic growth. The first reason is the factor including in all that countries who do expenditure on the military sector cannot be changed in the short run and the second reason is, the structure of international relations shows the similarities in the long run. As the countries are divided into two groups, unidirectional causality is detected from growth of economic to arms expenses in Australia, Brazil, China, Turkey, India, South Korea, and S Arabia. Generally, these countries do not have strong military power technology to use at economic development and in the case of 7 countries namely Germany, Canada, Italy, Japan, USA, UK, and Russia the causality is willing from arm expenses to growth rate of economy. In the case of Japan which is a relatively very small defense industry no causality running is detected so no comment could be given regarding japan.

In this section which is reviewed the literature related to the effect of arms expenses on growth rate of economy and employment in developed countries, the results overall claim that among the developed countries there are some countries in which after increasing military spending the economy is affected positive and there are some advanced countries which after having military expenditure still the economy is affected negatively or impact less.

In the following table all the above literatures which are related to the impact of arms expenses on economic of developed countries are summarized:

Table 4.2. Effect of Arm Expenses on Economic Growth and Employment of Developed Countries (DC)

Author	About	Method and Observations	Finding
Masoud and Munadhils (2015)	Association between arms expenses and economic growth of United State of America (USA)	41 years observations from 1970-2011. Through ARDL approach of testing	There is indirect association among economic growth and military expenses. Masoud and Munadhils, result suggest that United State of America (USA) economy military expenditure can play a non-productive role. It does not mean that it is not motivating the economy growth for long term.
Gerace (2002)	Growth rates of arms and non-arms of American government expenses and GDP	Comparative study between military and non-military expenditure. 46 years observations from 1951-1997.	nonmilitary expenditure moves counter periodic cyclically with real GDP growth rates, but arms expenses do not. This research could not find support for countercyclical link among the growth rates of United States arm expenses and gross domestic product and there is no actual prove to support for the hypothesis that arms expense and budget are adversely related to the GDP growth rate economy

Korkmaz (2015)	Impact of arms expenses on growth rate of economy and unemployment related to the 10 Mediterranean countries	Forecasts were made with stata12,7 years observations from 2005 to 2012 and panel data analysis is uses as method	If the military expenses affect economic growth of countries adversely so it will increase unemployment. It is found that mostly that countries which are importer of the ammunition and not producing and exporting will be faced unemployment and this situation comes true with the less developing countries. At the absence of the production there will be indirect impact on economic growth and really hurt the employment level.
Dunne and Smith (1984)	The economic consequence of reduced of UK arms expenses	NA (considered overall). Comparative study, supply and demand adjustment	Arms spending imposes and accommodate a burden and huge levels over the post-war certainly helped to the low rate of growth in United Kingdom (UK), reduction in military and arms expenses to 3.5 percent of GDP, matched by programmed to leave total public expenses would result in an absolute increase in employment of about 100 thousand

Diebold and Magali (2006)	Association among arms expense, growth rate and education in japan.	The Granger Causality test is used. 66 years observation from 1868-1934.	All the expenditure affected the economic growth in japan and military spending plays more vital role for both economic and social levels and expenses on education can be considered as one of the driving forces of the economic growth in japan ,chronologically, japan look to have developed in education sector and military to lead a certain level of growth, and if the military expenses lead economic growth so we can conclude that it is creating employment as well in Japan.
Bremmer and Kesselring (2007)	The effect of arms expenses in economic growth of North America (Canada, Mexico, and US)	43 observation between 1996-2005. VAR (vector autoregression) Model and Granger Causality test is used.	After increasing the military expenditure, the nominal GDP in Canada and Mexico is increased and employment is created, but in case of US as much the military spending in increase that much the growth in nominal GDP is reduced and unemployment created but long run the impact is not same like short run.

Satya (1996)	Association between arms expenses and unemployment in 18 OECD countries	26 years observation between the period of 1962-1988. VAR (vector autoregression model) and Granger Causality Test is used	One of the conclusions was that association among military and arms association and unemployment rate is not regulated across the countries. Arm spending has significant on Australia and Germany's employment rate while employment rates become worse in Denmark. In UK defense expenditure act as a motivational tool to change the unemployment rate. With Canada, USA, Italy, japan, Netherland, Spain, Austria, New Zealand, Sweden there is no causal association among military expenses and employment.
Mert and 0Ilhan (2013)	Association between arms expenses and economic growth among the superpower countries of the world	38 years observation between the period of 1973-2011. Toda Yamamato technique and ARDL approach is used	In case of USA, UK, Russia, China, Italy, South Korea and India there is a long run association exist among both variables and from growth rate of economy to arms expenses related to the Australia, Brazil, China, Turkey, India, South Korea and S Arabia there is unidirectional causality and the causality is running from arms expenses to economic growth in case of 7

			countries namely Germany, Canada, Italy, Japan, USA, UK, and Russia. In case of Japan which is relatively very small defense industry no causality running is detected.
Karagol, yilgor and Saygili (2014)	Effect of arms expenses on economic growth of 11 developed countries (USA, Germany…)	27 years observation from 1980-2007. Granger causality test and Pedroni cointegration test	Arms expenses is a factor in economic growth, or it justify the hypothesis which claims that defense expenses by developed countries directly contributes to their economics and within economic growth and military expenditure there exists a long-term relationship

4.3. Effect of arms expenses on Economic Growth and Employment in Developing Countries (DC)

As it is explained that the association among military expenses, economic growth and employment could differ around countries and regions so in this following part the effect of the military and arms expenses on economic growth and employment will be illustrated toward the developing countries or less developed countries which is called second world or third world countries, again inside these countries the effect of the military and arms expenses on economic growth and employment will vary which some literature is done, related that will be reviewed.

Hou and Chen (2013) conducted the research from regarding 35 developing countries from 1975-2009 to find out the impact of arms expenses on growth rate. For finding the result Solow Growth Model is applied and the system of Generalized Method of Moments (GMM) estimator is used. After the completion of research, they concluded and remarked that arms expenses have an indirect and significant impact economic growth of developing countries.

Lobont et al. (2019) did research related to the association among arms expenses and growth rate in Romania. This investigation is done by using annual data from the period of 1991up to 2016. The granger causality approach is chosen as a method to find out the result. According to this research it is proved that arms expense and growth rate are inter-related elements of each other for the long term like six years and as much the period is extending like eight-year and as arms expense increase the growth rate will be increased. From the economic point of thought, this result shows the effect of arms expense on various part as from capital and labor up to growth rate and usage of the resources at the national level will be experiencing the impact at different level.

Ajmair et al. (2018) for annual time series data from 1990-2015 launched research and the purpose of that research was to estimate the long period association among military expenses, economic growth, and the number of people in the military. For the completion of this research, the ARDL method is used. The result which is found shows that military spending in Pakistan is insignificant and the number of military people is significantly and directly associated with economic growth in long period. The result indicate that the short-run association exists among arms expenses, the number of army persons, and economic growth. In a short period, number of persons and military expenses are significantly and directly associated with economic growth but in the long period case is not the same, just number of army person affect the economic growth directly and significantly.

Shah et al. (2017) did research and the aim of that research was to find out the association among arms expenses and economic growth related to the five emerging economic countries of the world India, China, and others. For gaining result, Granger causality method and Cointegration test are used separately for each one of the countries and the data is taken from World Development Indicator (WDI) and Stockholm database (SIPRI) and different time series data is taken for each country and after applying the research the result for each country was quite different and interesting especially for the nuclear power country Russia, China and India. The relationship between India and Brazil was negative which means that as much the government increases the military spending that much the economy will have negative growth. The association among military expenses and economic growth is positive in China and Russia, which means that as much the military expenditure is increased that much the economy will be growing and in case of South Africa, it is insignificant, which means that the increasing or decreasing in military and arm expenses is not affecting the economic growth.

Sadeghieh et al. (2015) made research and the purpose of the study were to find the impact of arms expenses on the growth rate of turkey. So, the Granger causality test and Johnsen cointegration is applied to explore the long period equilibrium association and causality among military expenses (ME) and economic growth (GDP) for the case of turkey in which for the last decades it involves to the developing economy list. And the data is taken from 1988- 2013. After applying the research, it is found that in the long period arms expenses and economic growth are cointegrated. The Granger causality test suggests that from economic growth to military expenses there is unit-directional relationship running and according to that result the employment level is also affected somehow.

Yildirim and Sezgin (2003) made a research related to the effect of arms expenses on employment in turkey and from 1950-1997. The employment model is specified by using the CES production function and modelled employed ARDL

approach. Yildirim et al and Sezgin concluded the result that military expenses adversely affect employment in both a short period and a long period and military expenses lead to economic growth in turkey.

Dunne and Watson (2000) did investigation about the effect of arm expenses on employment in South Africa. The data is taken from 1963 – 1990 and used the ARDL approach. Such analyses provide an opportunity to test for crowding out effect. After conducting and launching the research it is found that some proves are supporting the thought of which arms expenses has a significant impact on long term of employment creation and indirectly impacting industrial structure and performance ability.

Huang and Kao (2005) investigated the effect of the arms expenses on employment in Taiwan. ARDL approach is used and the data is taken form 1966-2002. Huang and Kao concluded the result that military expenditure is capable to create advantage for the employment condition in the long period, but it destroys employment in a short period and any changes accruing in real GDP will be affecting the employment in short and long term.

Qiong and Junhua (2015) launched research to investigate the association between military expenses and the unemployment rate in China by using the data form 1991-2013. It tasted the time series of four variable like military expenditure, unemployment rate, nonmilitary expenditure and economic growth, the ARDL model is applied as the basis of the estimation. Qiong and Junhua concluded at the last part of the research command are devoid of grounds and more mentionable that in china two part of the government expenditure boasts opposite economic effect, and the result shows that after increasing the military expenses, the unemployment rate is also increased and after the increasing, the non-military expenditure reduce it with near 10 times lower than military and arms expenses. As there was one more research relevant

to the Chinas arms expenses impact on growth rate is seen that it was affected positively.

In this section literatures related to effect of arms expenses on growth rate and employment in developing countries are reviewed, the results overall claim that among the less developed countries developing countries there are some countries in which after increasing military spending the economy is affected positive and there are some countries which after having military expenditure still the economy is affected negatively or impact less. And the same case regarding employment there are some countries, which as much the military expenditure is increased that much the employment will be created and adverse of this situation is also exist that as much the government increased the military expenditure that much the unemployment will be created.

In the following table all the above literature which are related to the effect of arms expenses on the economic growth of developing or less developed countries are summarized:

Table 4.3. Effect of arms expenses on Economic Growth and Employment in Developing Countries (DC)

Author	**About**	**Method and Observations**	**Finding**
Yildirim et al and Sezgin (2003)	Impact of arms expenses on employment in turkey	47-years observations between the period of 1950-1997. The ARDL approach is used.	Military expenditure indirectly affect employment in both short and long period and arm expenses lead economic growth in turkey.

Ajmair, Abbassi and Misbah (2018)	Examine the long-term association among arms spending, economic growth and number of people in military	25-year observations are used from 1990-2015. For handling of this study used ARDL approach is used	The result which is found shows that, military spending in Pakistan are insignificant and number military people are significantly and directly related with economic growth in long period. Number of persons and military expenses are significantly and directly related with economic growth in short period but in long period, case is not the same, just number of army person affect the economic growth positively and significantly.
Sadeghieh, Taspinar and Gorkmanoglu (2015)	The effect of arms expenses on economic growth of turkey	25-years observation are used from 1988- 2013. The Granger causality test and Johnsen cointegration is applied	in the long period arms expenses and economic growth are cointegrated. The Granger causality test suggests that from economic growth to military expenses there is unit-directional relationship running and according to that result the employment level is also affected somehow.
Shah, He, Yu and Xiaoqin (2017)	Association among arms expense and growth rate related to the five-emerging economic	25-years observation are used from 1988-2013. The result Granger causality and Cointegration test are used separately for each one of the countries	The relationship of the India and Brazil was negative. The association among the military expenses and economic growth are positive in China and Russia which and in case of South Africa it is insignificant, which means that the increasing or decreasing in arms expense is not affecting the growth rate.

Dunne and Watson (2000)	Impact of arms expenses on employment in south Africa.	27-years observation are used from 1963 – 1990. The ARDL model is used and data is taken from WDI and SIPRI	In long period creation of employment, arms expense has its significant impact and adversely impacting industrial structures efficiency.
Lobont, Glont, Bedea and Vatavu (2019)	Correlation among arsm expens and growth rate in Romania	25 years observation over the period of 1991-2016. Granger causality approach is used as method	From the economic point of thought, this result shows the effect of arms expense on various part as from capital and labor up to growth rate and usage of the resources at the national level will be experiencing the impact at different level.
Huang and Kao (2005)	Impact of the arms expense on employment in Taiwan	36-years observation which is from 1966-2002. The Autoregressive Distributed Lag (ARDL) is used	For the long-term employment will be affected positive through the arms expenses but for the short-term it will be affected indirect and there is directional causality among the GDP and employment in short period and long period.
Qiong and Junhua (2015)	The relationship between military expenditure and unemployment.	22-years observation form 1991-2013.The ARDL model is applied	That after increasing the military and arms expenses the unemployment rate is also increased and after the increasing the non-military expenses reduce it with near 10 times lower magnitude than military expenditure.

5. Data and Methodology

In this part, the data sources are explained and the methodology is based on the Vector Autoregression (VAR) model according to Sims (1980) and Sun et al. (2010) which is an ad hoc dynamic multivariate model, treating simultaneous sets of variables equally, with each endogenous variable regressed on the lags of all other variables and its own lags and in a finite order system. Through the ADF unit root test the stationarity of the variables are tested (Dickey and Fuller 1981). Then it will be discussed regarding the VAR Granger Causality test individually and jointly as the Wald Test (1943).

5.1. Data

Time-series data is used for the analysis of this study. The data is taken from the 2004-20018 period, which unfortunately because of internal war in Afghanistan there is no data available before 2004, so taking data for 15 years is a compulsory order. The data are extracted from different sources, in which the military expenses are taken from Stockholm database (SIPRI), and the two other variables, the GDP and Employment are taken from World Development Indicator (WDI).

5.2. Methodology

5.2.1. LOG Transformation

Logarithmically transforming, variables in a regression model is a very common way to handle situations where a nonlinear association exists between the dependent variable and independent variables. This process is useful for skewed data like compressing the Y-axis when plotting histograms. For example, if there is a very large range of data, then smaller values can get overwhelmed by the larger values, taking the log of each variable enables the visualization to be clearer. The log

transformation can decrease the variability of data and make data conform more closely to a normal distribution, so here all the dependent and independent variables are transformed into the log form, and then it is used for the stationarity test with the help of the Augmented Dicky Fuller (ADF).

For example, as shown by Feng and colleagues, if Yi follows a log-normal distribution (μ, σ^2), then the mean of Yi is given by $E(Yi) = exp(\mu + \sigma^2/2)$. If we log-transform Yi, the transformed log Yi follows a normal distribution with a mean of μ. So, by following the above rules all the dependent and independent variables are transformed into the log form and used in the VAR Model.

5.2.2. Unit Root Tests

Sometimes, variables are increasing over time or in other word has unit root which is looking problematic in the running model and econometrics analysis and make the model spurious or meaningless, even for any type of analysis of the variables which have unit root or not stationary will lead to the spurious regression problem. If the series is not stationary, you can achieve a model with promising but will be as false diagnostic tests. So, what will be the solution if the variables are not stationary at the level? one solution for overcoming to this problem will be to take the first difference the series successively and if the variables do not become stationary or have unit root so the second difference of the series must be taken to transfer the data to the stationarity position, and if the variable is not changing over time so keep constant so that is called stationarity. For tracking existence of the non-stationarity or unit root there a lot of tests in which the most expanded used test is the Augmented Dicky Fuller (ADF) unit root test. Regarding the current research the stationarity of data is obtained by lunching the Augmented Dicky Fuller (ADF) unit root tests at the levels and first differences which could convert the series to the stationarity.

5.2.3. Augmented Dickey Fuller Unit Root Tests

Test for the stationarity Dickey and Fuller (1979) referred to a unit root test which is established very well. The basic autoregressive unit root test to accommodate general ARMA models with unknown ordered their test is referred to as the Augmented Dickey-Fuller (ADF) test. The ADF tests the null hypothesis that a time series $Y(t)$ is $I(1)$ against the alternative that it is $I(0)$, if dynamics in the data have an ARMA structure. The ADF test is based on estimating the test regression. The ADF test is conducted with all its properties, constant and trend both are involved in first regression, just constant is include in second regression and for the third regression there is neither trend exist nor constant.

The current regression includes both of that (constant and trend).

$$\Delta Yt = C + T + \alpha yt\text{-}1 + \sum \beta i \Delta yt\text{-}i \qquad (1)$$

The specification of the following model is as follow:

Δt: Change in y

T: Trend

C: Constant

β: Coefficient

α: Coefficient

t: Year (2004-2018)

The following hypothesis are tested:

$H0: \alpha = 0$ (null hypothesis claims as variables have unit root or it is like non-stationary)

$H1: \alpha < 0$ (alternative hypothesis claims as variables do not have unit root or like stationary)

having unit root or stationarity will be rejected if α is smaller than zero and the alternative hypothesis will not be rejected which means that Yi is stationary will be accepted.

5.2.4. LAG Selection

The lag lengths are chosen according to Akaike Information Criterion. Akaike's information criterion (AIC) compares the quality of statistical models set to each other and after the selection of that lag the model could be run and fitted well. By that formula which lag could be selected best is as follow:

$$\boldsymbol{AIC = n\, log^{(\hat{\sigma}^2)} + 2K} \qquad (2)$$

Where

$(\hat{\sigma}^2) =$ residual sum of squares/n

$n =$sample size

$K =$the number of model parameters

Although there are a lot of ways to select the Lag like KPSS but the mostly the AIC is the useful one and in this study the Lag is selected according the AIC which is 2.

5.2.5. Vector Autoregression (VAR) Model

Vector autoregressions (VARs) model have become the best model for macroeconomic forecasting and one of the most flexible, successful, and easy to use models for the analysis of multivariate time series data. The VAR model was

popularized by Sims (1980) who argued that a set of variables should not be predetermined as exogenous or endogenous if there is true simultaneity among them, they should instead be treated on equal footing. Additionally, the VAR model could be used to explore the impulse response which shows the response of a variables when a shock is given to other variable and VAR Granger causality also exist inside that which shows the directional and unidirectional causality among the variables and through the decomposition it could be forecast the error variance among all the variables

Autoregressive models only model one series Yi on its own past vector autoregressive (VAR) models consider several series. The model of the VAR with time series Yi and Zi and one lag selection can be shown as follow:

$$yt = \delta 0 + \alpha lyt - l + \gamma lzt - l + ult \quad (3)$$

$$zt = \eta 0 + \beta lyt - l + plzt - l + u2t \quad (4)$$

Although in this thesis the lag selection is 2 but here simplicity, we got the lag 2. Where $U(t)$ is the error term with zero expected value given past information on Y and Z and each variable depends only upon the previous of Yi and Zi but can be extended to depend on different combinations of the previous k value of booth variables, and all the variables are treated as endogenous.

So before running the model we must decide regarding the lag length, k. for this purpose by using the advantage of information criteria like the Schwarz or Akaike we chose the lag length that minimizes the value of criteria which is explained above with all its details.

The model also needed to be checked for its stationarity which is explained above that how the stationarity is checked and some variables are stationary at the level $I(0)$ and some variables are stationary at first order $I(1)$ by the help of Augmented Dickey-Fuller test (ADFT). Although the decision is taken through ADFT the Kwiatkowski Phillips Schmidt Shin (KPSS) also shows the same result. After running the VAR model then there would be diagnostic checking for each equation and the heteroskedasticity, normality, serial correlations and stability will be checked.

5.2.6. VAR Granger Causality

VAR model is like past observation of z help to forecast y, after controlling for past observation of y. as follow it may observe that

$$E(yt|It\text{-}l) \neq E(yt|Jt - l)$$

Where $It\text{-}l$ holds information of pasty and z while $Jt - l$ holds only information of pasty, it can be said that z Granger causes y. Such testing was developed by Granger (1969) and although it is called a causality test, it is only implying a correlation between the current value of y and past values of z. The movements in z could directly cause movements in y but it does by no means prove it.

The variables in this thesis are the gross domestic product (GDP), military expenses, and employment, and here the Granger Causality test is used individually, that does military expenditure cause GDP or does GDP cause military expenditure? Does employment cause the GDP or does the GDP cause employment. And there is a joint test as well that does military expenditure and employment both affect the GDP or not? And the joint test is done regarding the Wald Test (which also called Wald Chi-Squared Test as well to search out if explanatory variables in a model are significant. By the word of significance means that they add something to the model, variables that add nothing can be deleted without affecting the chosen model is a meaningful way or

we can say that if the test shows that parameters are not zero you should include the variables in the model). And in this thesis the significance of both independent variables is (jointly) tested regarding the Wald Test.

5.2.7. The Impulse Response Function

Although the Var Granger causality test is one of the better ways to justifying the relationship between variables in a VAR model, it will not be able to provide the specific response that is there negative or positive association among them or for how long the effect is for one of the variables. So that is why the impulse response function felt required because the existing relationship among the variables either positive or negative can be shown and any kind of policy and decision could be arranged regarding that response, such as Ui or Uz in the above equation. For a better understanding of that, suppose that if there is an increase of one standard deviation to Ui, for sure it will affect Yt, as the Yt also exists in Zt equation, this variable will also be affected. A shock in the Zt error term, Uz will have effect on Yt, the impulse response function catches out the effect of such shocks for many periods in the future. Gujarati (2009, p. 853-854).

The impulse response is the derivative with respect to the shocks. Impulse response at horizon h of the variables to an exogenous shock to variable j is as follow:

$$\frac{\partial y_{t+h}}{\partial \epsilon_{j.t}} = \frac{\partial}{\partial \epsilon_{j.t}} (\prod y_{t+h-1} + \epsilon_{t+h-1}) = \frac{\partial}{\partial \epsilon_{j.t}} (\prod^{h+1} y_t + \sum_{i=0}^{h} \prod^{i} \epsilon_{t+h-1}) \qquad (5)$$

This derivative will eliminate all terms but one which is namely the term in the sum which is $\prod h \in t$ for that we get the following equation:

$$\frac{\partial y_{t+h}}{\partial \epsilon_{j.t}} = \frac{\partial}{\partial \epsilon_{j.t}} (\prod^{h+1} y_t + \sum_{i=0}^{h} \prod^{i} \epsilon_{t+h-1}) = \frac{\partial}{\partial \epsilon_{j.t}} \prod^{h} \epsilon_t = \prod^{h} ej \qquad (6)$$

In this thesis the impulse response is taken out and the result is interpreted regarding that in which the significance of the variables is got through that.

5.2.8. VAR Model for Afghanistan

The VAR model for Afghanistan is explained by its equation as follow but before that its variables are introduced.

5.2.9. Defining the Variables

The variables which are used here are the gross domestic product (GDP) which is used as dependent variable and military expenses and employment which is used as independent variables. Mostly there is a lot of variables that are used as independent variables but because of having less observation we cannot include more variables. Due to the internal war in Afghanistan unfortunately more data is not available.

After log transformation all the variables converted to stationarity which the GDP is stationary at level $I(0)$ and the military expenditure and employment get stationary at the first difference $I(1)$ and the lag selection, then emplacing the variables in the model as endogenous and running the model, VAR model for Afghanistan got the following shape:

$$GDP = F(GDP_{t-1}, GDP_{t-2}, EM_{t-1}, EM_{t-2}, ME_{t-1}, ME_{t-1}) \quad (7)$$

$$EM = F(GDP_{t-1}, GDP_{t-2}, EM_{t-1}, EM_{t-2}, ME_{t-1}, ME_{t-1}) \quad (8)$$

$$ME = F(GDP_{t-1}, GDP_{t-2}, EM_{t-1}, EM_{t-2}, ME_{t-1}, ME_{t-1}) \quad (9)$$

There will be diagnostic testing for all above 3 equations and the heteroskedasticity, normality, serial correlations and stability will be checked.

GDP: Gross Domestic Product (in current US$)

EM: Employment (number of employed person)

ME: Military Expenditure (in current US$)

C (7), C (14), C (21): Are the constant

C (1), C (2), C (3), C (4), C (5), C (6), C (8), C (9), C (10), C (11), C (12), C (13), C (15), C (16), C (17), C (18), C (19), C (20): Are the coefficients

Equation 1 is the effect of GDP, arms expenses, and employment with 2 lags on GDP.

Equation 2 is the effect of GDP, arms expenses, and employment with 2 lags on employment level.

Equation 3 is the effect of GDP, arms expenses, and employment with 2 lags on military expenditure. After giving a shock to the innovation, all the three model will be affected so that is why the impulse response is required to gain the response from all the equation.

6. Empirical Result

In this chapter, first we present the empirical result of the model which is taken out will be illustrated line to line and there will be some discussion related the result and the policy will be provided regarding that results.

6.1. Empirical Results

ADF unit root test is launched Before running VAR model. The results of the ADF test indicate that the dependent variable is stationary or has not unit root at level and both independent variables are stationary at the first differencing. The following table shows the results of the test.

Table 6.1. Unit Root Test Result for Level

Variables	T-State	1%	5%	Prob
GDP	-3.304	-4.004	-3.098	0.034
EM	1.146	-4.200	-3.175	0.994
ME	-1.954	-4.004	-3.098	0.300

Table 6.2. Unit Root Test Result for First Difference

Variables	T-State	1%	5%	Prob
GDP				
EM	-4.150	-4.200	-3.175	0.010
ME	-3.142	-4.057	-3.119	0.04

After testing the stationarity or unit root test then for running the model there must be the lag selection. There are more criteria for lag selection like Akaike

Information Criteria (AIC), and other criteria which are shown in the following table, but the most acceptable criteria is AIC. And according to the following result we can see that AIC and all other criteria point for the 2 lags, so the lag is selected 2 and run the model.

Table 6.3. Lag Selection Criteria

Lag	LR	FPE	AIC	SC	HQ
0	NA	1.51e-07	-7.194481	-7.073255	-7.239364
1	35.211	8.96e-09	-10.9596	-9.611054	-10.27549
2	22.37*	7.0e-10*	-130.7145*	-12.22287*	13.38563*

* Indicate lag order selected by different criterion, as the lag get more justification that will be good sign for accepting it as our lag order and here it is shown that more of the criteria are pointing for the lag 2 thus as a result the lag could be selected 2.

After log transformation, making all the variables stationery and lag selection the model will be run, which there will be three equations and each variable will be taken as the dependent on its own 2 lags and two other variables with 2 lags.

For running such a model, the fulfillment of conditions like serial correlation, model stability, heteroskedasticity, and normal distribution is the good singe and regarding this model, there is no serial correlation, the models look quite stable, residuals are normally distributed and there is no heteroskedasticity which are all the good singe of a model. And now we see that model is quite ready for running.

We can see that overall, there are 21 coefficients and some of them are significant (its P-value is less than 5%) and there is some coefficient that is not significant (its P-value is more than 5%). Although we cannot conclude any specific

conclusion from the following result, still it is pre-procedure for running the VAR model which shows the significance of some coefficient.

6.2. The VAR Model Result for GDP, Employment and Military Expenses

Although after running the VAR model this result will be taken out by having this result no conclusion can be gain, so for having a significant result the impulse response which is like a shock who gives to the residual and affect all the model will be relied on, and in the following part first, the diagnostic testing is done for the heteroskedasticity, normality, serial correlation and stability for each equation separately and then the impulse response is gain and interpreted.

After running the vector autoregression (VAR) model, there will be 3 equation and here each one is tested as diagnostic.

$$GDP = F\ (GDP_{t-1}, GDP_{t-2}, EM_{t-1}, EM_{t-2}, ME_{t-1}, ME_{t-1}) \qquad (1)$$

Table 6.4. First Equations Diagnostic Test

Normality test	Jarque- Bera	Prob
	0.331818	0.847123
Serial correlation LM test	Obs*R- squared	Prob.Ch square
	2.147127	0.1257
Heteroskedasticity test	Obs*R- squared	Prob.Ch square
	8.804172	0.3591

Stability test	Cusum test (5% significance)

The second equation which is derived from vector autoregression (VAR) model is tested as follow:

$$EM = F\ (GDP_{t-1}, GDP_{t-2}, EM_{t-1}, EM_{t-2}, ME_{t-1}, ME_{t-1}) \quad (2)$$

Table 6.5. Second Equations Diagnostic Test

Normality test	Jarque- Bera	Prob
	0.331818	0.847123
Serial correlation LM test	Obs*R- squared	Prob.Ch square
	7.827877	0.0200
Heteroskedasticity test	Obs*R- squared	Prob.Ch square
	8.762275	0.3627
Stability test	Cusum test (5% significance)	

The third equation which is derived from VAR model is as follow:

$$ME = F\ (GDP_{t-1}, GDP_{t-2}, EM_{t-1}, EM_{t-2}, ME_{t-1}, ME_{t-1}\ ) \quad (3)$$

Table 6.6. Third Equations Diagnostic Test

Normality test	Jarque- Bera	Prob
	0.331818	0.847123
Serial correlation LM test	Obs*R- squared	Prob.Ch square

	6.680497	0.0354
Heteroskedasticity test	Obs*R- squared	Prob.Ch square
	9.627212	0.2922
Stability test	Cusum test (5% significance)	

Consequently, the impulse response is explained in the following part after the completion of the diagnostic test.

6.3. Impulse Response

The impulse response is important to step of econometrics analysis in vector autoregressive (VAR) models. Reaction to a shock in one or more variables is the main purpose of impulse response which explains through evolution of a model's variables.

Kilian (1998) searched bias-corrected bootstrap confidence intervals explicitly account for the bias and skewness of the small sample distribution of the impulse response estimator and found through empirical example shows that bias-corrected bootstrap intervals may imply an economic interpretation of the data that are substantially different from the standard method.

The impulse response is used to find out the positive, negative or irrelevant impact of independent variables to the dependent variable, as one of the questions in this research is to find out the effect of arm expenses on economic growth that does military expenditure is affecting the economic growth as positive, negative or irrelevant? so for completion and gaining such a result the impulse result must be used. As Bremmer and Kesselring (2007) has done research related the effect of arms expenses on the economic growth of North America (Canada, Mexico, and the US),

they found that after giving a shock to the military expenditure the GDP in Canada is increased and employment is created but in case of US as much the military spending is increased the GDP is reduced the way in which they could find this result is through the impulse response and Granger causality. Some research has been done by Satya (1996) to find out the association among the arms expenses and unemployment in 18 OECD countries and the conclusion claims that association among military and arms association and unemployment rate is not uniform across the countries. Arm and defense have a favorable effect on Germany and Australia. In the UK the defense expenditure act as a motivational tool to change the unemployment rate. With Canada, the USA, Italy, Japan, Netherland, Spain, Austria, New Zealand, Sweden there is no causal association among military expenses and employment rates. All these relationships are found through the impulse response and Granger causality test.

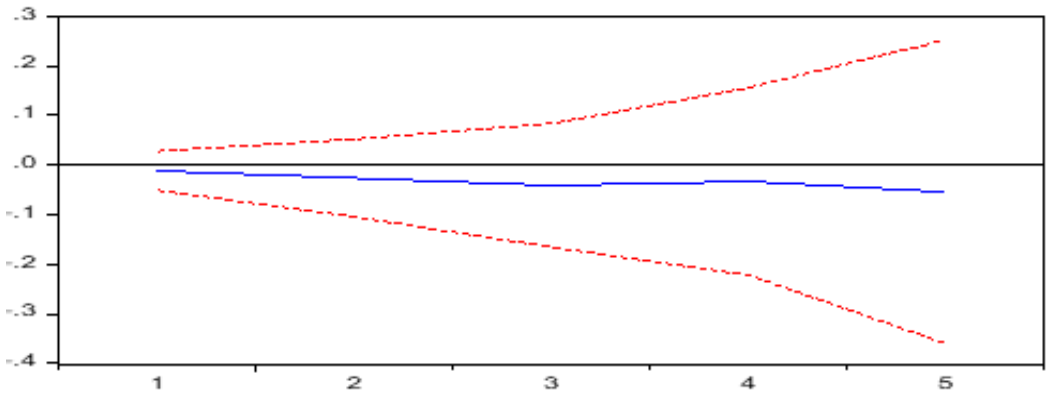


Figure 6.1. The Impulse Response of GDP to Military Expenses

The above graph is the impulse response of GDP when a shock is given to the military expenditure. Although it shows an indirect association among the arms expenses and GDP, we cannot conclude any comment because of insignificance (it the confidence interval or band contain zero in horizontal axis then it is statistically

insignificant). The reason might be that the military expenditure of Afghanistan is being paid by foreign donner and the expense portion which is being paid by Afghanistan's military budget is negligible so it can not affect the GDP.

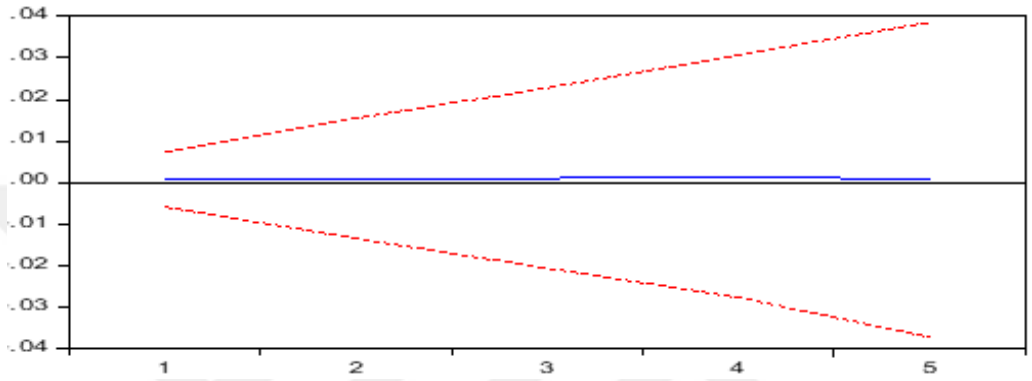


Figure 6.2. The Impulse Response of Employment to Military and Arm Expenses

The above graph is the impulse response of employment when a shock is given to the military expenditure. Although it shows a direct association among the arms expenses and employment, but we cannot conclude any comment because of insignificance (it the confidence interval or band contain zero in horizontal axis then it is statistically insignificant).

The reason might be the non-independency of Afghanistan's military expenditure because if the military expenditure is paid by government then the portion of the budget which is allocated for military expenditure will be considered that in which part is it used, is it used for military operation or infrastructure and after that, it will be concluded.

Although in Afghanistan mostly the military budget is going to be used for the military operation which may damage the employment level but here it is quite insignificant because it is not what to be paid by Afghanistan's government it is being paid by foreign donner.

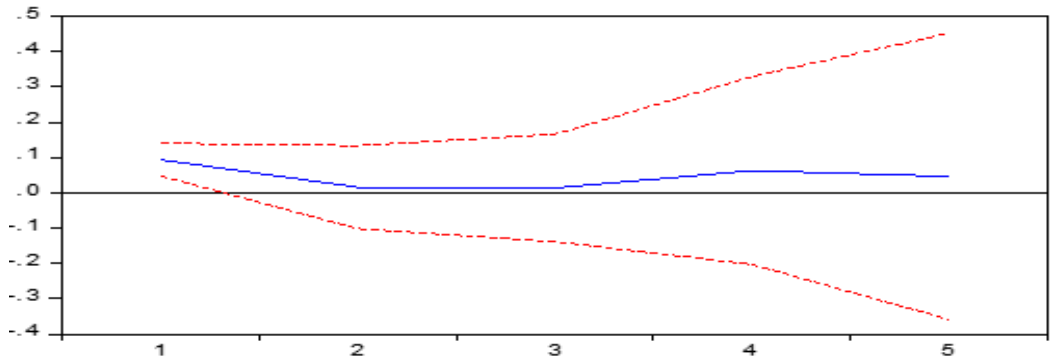


Figure 6.3. The Impulse Response of Military Expenses with Self

The above graph is the impulse response of military expenditure which a shock is given to the military expenditure. Just the first period is significant which means that if a shock is given to the military expenditure so for one coming period it will be positive which is significant and for the remaining period still, no comment can be written because of insignificance. The reason might be that if the military expenditure is increased for this year so for the first coming year it may affect positively itself but for next years it depends on situations and portion of the budget, that is why it is insignificant.

So finally for the current result, we can conclude that if a shock is given to the military expenditure the impulse response of the GDP and employment is insignificant and we cannot have any comment related to that, but military expenditure will be having a positive relationship for one year and after that still we cannot have any comment because the remaining period is still insignificant. Now we are going to the VAR Granger causality and will see that is there any causal relationship or not.?

6.4. VAR Granger Causality

Once the VAR Granger causality is tested individually and it is tested as joint as well, in the following part is pointing out and illustrated.

Granger (1969) state that Granger causality test is a statistical hypothesis test for determining whether one-timer series is useful in predicting and forecasting each other and to clarify the relationship between the variables.

The VAR Granger causality is used to find out the directional and in directional causality among the independent variables and dependent variable, as one of the questions in this paper to find out the causality of defense expenses and economic growth that does arm expenses is causing the economic growth or does economic growth is causing arms expenses? so for completion and gaining such a result the VAR Granger causality result must be used. Satya (1996) tries to find out the causality among arms expenses and unemployment in 18 OECD countries and the conclusion claims that association among military and arms association and unemployment rate is not organized across the countries. Arm and defense expenses has a favorable effect on Germany and Australia. In the UK the defense expenditure act as a motivational tool to change the unemployment rate. With Canada, the USA, Italy, Japan, Netherland, Spain, Austria, New Zealand, Sweden there is no causal association among military expenses and employment rates. all these relationships are found through the impulse response and Granger causality test. As Bremmer and Kesselring (2007) has done research related the effect of the arm and defense expenses on the economic growth of North America (Canada, Mexico, and the US), they found that after giving a shock to the military expenditure the GDP in Canada is increased and employment is created but in case of US as much the military spending is increased the GDP is reduced the way in which they could find this result is through the impulse response and Granger causality.

Table 6.7. The VAR Granger Causality Individually for GDP and Military Expenses

Dependent variable: GDP			
Excluded	Chi-sq	Df	Prob.

ME	1.598020	2	0.4498
ALL	1.598020	2	0.4498
Dependent variable: ME			
Excluded	Chi-sq	Df	Prob.
GDP	29.46882	2	0.0000
ALL	29.46882	2	0.0000

According to the above table, if some policy changes accrue to the GDP or economic then it will cause the military expenditure and policy changes to the military expenditure will not cause GDP (unidirectional causality). The reason is that most of the military expenditure is being paid by the foreign donners that is why policy changes (increase or decrease) in military expenditure will not affect the GDP, but if there are some policy changes (increase or decrease) in GDP then it will affect military expenditure because after the increase or decrease to GDP there will be some add up and cut off for military budget which will be affected.

Table 6.8. The VAR Granger Causality Individually for Employment and Military Expenses

Dependent variable: EM			
Excluded	Chi-sq	Df	Prob.
EM	0.828704	2	0.6608
ALL	0.828704	2	0.6608
Dependent variable: ME			
Excluded	Chi-sq	Df	Prob.
EM	23.21954	2	0.0000
ALL	23.21954	2	0.0000

According to the above table, if some policy changes accrue to the employment it will cause military expenditure, and policy changes to the military expenditure will not cause employment (unidirectional causality). Because if there is some increase or decrease in employment it means that military budget is used for infrastructure so it claims that an increase or decrease in employment will have casual relation with military expenditure but military expenditure will not cause employment because most of the military expenditure is being paid by outside sources.

Now, in the following form it is Tasted as joint that does jointly the independent variable cause the dependent variable or not.

Table 6.9. The VAR Granger Causality Jointly for all Variables

Dependent variable: GDP			
Excluded	Chi-sq	Df	Prob,
EM	9.715232	2	0.0078
ME	7.328686	2	0.0256
All	12.07455	4	0.0109
Dependent Variable: EM			
Excluded	Chi-sq	Df	Prob.
GDP	0.546175	2	0.7610
MEL	0.319983	2	0.8522
All	1.202766	4	0.8776
Dependent variable: ME			
Excluded	Chi-sq	Df	Prob.
GDP	8.841085	2	0.0120
EM	6.469283	2	0.0394
ALL	54.75304	4	0.0000

According to the joint test, it is seen that if some policy changes accrue to the employment and military expenses so it will cause GDP (because individually the portion of military expenditure and employment which is being paid by the government is very minor and negligible so it will not be able to affect the GDP but jointly the portion will be getting significant and high so will cause GDP). If some policy changes accrue to the employment and GDP so it will cause military and arm expenses (because after the increase or decrease to GDP there will be some add up and cut off for military budget which will be affected and if there is some increase or decrease in employment it means that military budget is used for infrastructure so it claims that an increase or decrease in employment will have casual relation with military expenditure, that is why both jointly affect the military expenditure) and any kind of changes to the military expenses and GDP will not cause employment.

As a summary for gaining empirical results, first, the data is transformed to the log and then the unit root test has been done through the ADF and KPSS test in which at the first difference the variables are stationary then the lag criteria is selected by the help of AIC, FPE, LR, SC and HQ which is 2 and VAR model is run in which there are 3 equation comes out so for each one the normality test, serial correlation test, heteroskedasticity test, and stability test is used which all comes correct then the impulse response and to recommend about the effect of arm expenses on the economic growth of Afghanistan VAR Granger causality test is used.

Overall we can conclude that impact of arms expenses on the economic growth of Afghanistan is insignificant, there are some countries in which the relationship of arm expenses and economic growth is positive or negative which means that as much the military and arms expenses is increased that much the economy will be grown and there are some countries that there is adverse association among both factors which means that as much the military expenses increase that much the economy will be having negative growth, but there are some countries as well exist that as there is no significant association among military expenses and economic growth

which means that as much the military expenses is increased or decreased it will not affect the economic growth at all. in the following literature, it is seen in case of Brazil the association among both variables are indirect and the association among both elements in Russia, India, and China is positive but in case of South Africa it is insignificant and there is no evidence of association between arm expenses and growth rate of economic

Salman et al. (2017) did research and the aim of that research was to find out the association among arm expenses and economic growth related to the five emerging economic countries of the world Russia, India, and other countries. To find the result, Granger causality and Cointegration test are used separately for each one of the countries and the data is taken from world development indicator (WDI) and Stockholm database (SIPRI) and different time series data is taken for each country and after applying the research the result for each country was quite different and interesting especially for the nuclear power country Russia, China, and India. The relationship between India and Brazil was negative which means that as much the government increases the military spending that much the economy will have negative growth. The association among the arms expense and growth rate are positive between China and Russia which means that as much the military expenditure is increased that much the economy will be growing and in case of South Africa it is insignificant, which means that the increasing or decreasing in military expenditure is not affecting the economic growth.

Ozsoy and Ipek (2010) lunched a research-related the relationships between defense spending macroeconomic variables. The data was from 1980-2006, to find the impact of defense spending on economic-related to Egypt, Israel, Jordan and Turkey the VAR model and Granger causality test has been used, which for turkey there is a positive relationship, for Israel, there is a negative relationship but related to Jordan and Egypt there is no significant among the variables.

Pradhan et al. (2013) made research for 22 countries from 1988-2012 through causality tests. The difference between Pradhan et al and this research is that for Pradhan et al's research the conclusion shows but equilibrium relationships among the military expenditure and economic growth but this research shows an insignificant relationship among the defense expenses and economic growth so the reason could be the allocation of defense budgets from GDP in all 22 countries but the case is not same with current research.

Pen et al. (2014) 10 Middle east countries are considered for causal association among the arms expenses and growth rate through the causality analysis. The current research's similarity and differences are that current research shows the unidirectional causality among the arms expenses and economic growth but at the same time claims unidirectional causality from arm expenses to growth for Turkey, one-side causality from economic growth to arms expense are exist for the Syria, Kuwait, Lebanon and Egypt,, for Israel bidirectional causality and no directional causality for Saudi Arabia, Oman and Jordan. The reason behind Turkey can be negligibility of military expenditure by compare of GDP same like current research regarding Afghanistan and the reason toward Egypt, Kuwait, Lebanon, and Syria can be that there are some elements who affect the GDP at somehow, regarding Israel the main reason can be the dependency of defense and arm expenses and economic growth to each other but the reason for the for Saudi Arabia, Oman and Jordan can irrelevancy and non-dependency of arms expenses with growth rate of economy while or maybe the budget for the military expenditure is not allocated from GDP, which reason behind the current research is same.

Kollias et al. (2004) paper examine the association among arms expenses and growth for 15 members of European countries which used co-integration and causality tests from 1961-2000. Its result shows that from economic growth to arm expenses there is directional causality, which is against the current research, but unidirectional

relationship is seen among the military expenditure and economic growth in current research.

Lobont et al. (2019) did research related to the association among arms expenses and growth rate in Romania. This investigation is done by using annual data from the period of 1991up to 2016. The granger causality approach is chosen as a method to find out the result. According to this research it is proved that arms expense and growth rate are inter-related elements of each other for the long term like six years and as much the period is extending like eight-year and as arms expense increase the growth rate will be increased. From the economic point of thought, this result shows the effect of arms expense on various part as from capital and labor up to growth rate and usage of the resources at the national level will be experiencing the impact at different level. The difference between the conclusion of Lobont et al's research and current research is that it shows no effect of arm expenses on economic growth. The reason behind both Lobont et al and current research can be the allocation of military budget from GDP for Romania and non-allocation of military budget regarding the current research about Afghanistan.

Alexander (1990) made a research to find out the impact of defense and arm expenses on economic growth which used the VAR model. The similarity and differences of Alexander and the current research are that its conclusion claims that effect of arms expense on growth rate are neither significantly direct nor indirect while the current research's conclusion shows the insignificant relationship of military expenditures and economic growth. The reason for insignificancy of this result can be the non-dependency of both variables to each other and maybe non-allocating of military expenditures from GDP which same reason exist for the effect of defense expenses on the economic growth of Afghanistan.

Kaldor (1976) conducted research of 40 least developed countries for 1963-1973 that among the arms expenses burden and growth rate -0.18 coefficient is

generated which does not have any similarity with the current research,, the reason can be the non-productivity of military ammunition and importing of that while for Afghanistan the reason can be non-dependency and allocation of the military budget.

Heo (2010) also lunched a VAR model like Payne and Ross (1992) to test that is there any causal relationship among arm expenses and growth rate of economy or not? The result shows that there is no causal association among arms expenditure and economic growth the same as current research, the reason can be non-allocation of military budget from GDP or irrelevancy of both elements.

Pivetti (1992) and Cypher (1987) lunched research-related economic growth and defenses expenses which that defense spending is enhancing the economic growth. which is quite averse to current research and the reason behind can be the interdependency of military expenditures and economic growth with each other.

7. **Conclusion and Policy Implication**

7.1. Conclusion

The contribution of this thesis is to provide the empirical evidence to the association among arms expenses and economic growth in Afghanistan through the VAR model.

Ultimately, the analysis revealed that arms expenses does not have significant effects on the economic growth of Afghanistan for the 15 years period from 2004-2018. And after running the Var Granger causality it revealed that if some policy changes accrue to the gross domestic product (GDP) or economic then it will cause the military expenses and policy changes to the military expenses will not cause GDP. According to the joint test, it is seen that if some policy changes accrue to the employment and military expenditure so it will cause gross domestic product (GDP), if some policy changes accrue to the employment and GDP so it will cause military and arms expenses.

Hypothesis 1 of our study which state that military expenses can have positive(direct) impact or negative(indirect) impact on economic growth or may have no impact, it differs country to country, according the result it is shown that military and arms expenses does not have any significant effect on growth rate of economy and the hypothesis 2 of our study which state that Military and arms expenses can have negative impact on employment mostly the developing countries come true with this nature, but regarding this result, if some policy changes accrue to the employment it may cause military expenditure, and the last hypothesis of our study state that Military expenditure and employment both cause economic growth (affect the economy growth positively), regarding this empirical study after running VAR Granger causality test we cannot reject that hypothesis and if some policy changes accrue to the military and arm expenses and employment then both jointly will cause economic growth.

There are some other research results which shows the same insignificance of arms(defense) expense and economic growth as the research is conducted by Biswas and Ram (1986) which used cross-sectional subgroup estimation on 58 less developed countries and the result which found is that impact of military and arms expenses do not have a significant impact on economic growth. Same research has been launched by Mintz and Stevenson (1995) on the data of 103 countries by using a longitudinal estimate, which found that impact of arms expenses on economic growth is not significant. And the same insignificance of arms expenses on economic growth is found by Dunne and Saal (2000) related to South Africa which has its own reason to support the result.

7.2. Policy Implication

Policy implication, which is provided regarding the result, but unfortunately because of internal war existence for a long time in Afghanistan the data are missed and we couldn't collect more observation to run our model for a long period of time. In our study that is only for 15 years of data from 2004-2018. So, by considering the result and as overall Afghanistan is conditionally investigated and considered, we can provide the following policy:

((It is getting a long time that Afghanistan's military, arms expenses, and ammunition are being paid and provided by the outside and foreigner donners so that is why it does not affect the GDP and the portion of Afghan arms budget which is allocated to the military expenses from Afghanistan's financial budget is not as much by comparing of gross domestic product (GDP) to affect it. But at the none providing of military tools and ammunition by the outside, Afghanistan itself must allocate a big portion of its budget and provide the militaries requirement, so for sure Afghanistan is not producing any type of ammunition and must allocate the budget of education, infrastructure, industries, etc. to import the military tools and ammunition for fulfilling of the

militaries requirement, which will make worse the economy. After considering all the above situation it is suggested for Afghanistan that starts producing and exporting military tools if there is no export at least import must be stopped that it may not be felt necessary to use the budget of education, infrastructure, industries, etc. Producing military ammunition and tools will be decreasing your import and create employment (that works as a motive machine for economic growth) inside the country, which no doubt that will have a direct effect on the economic growth of Afghanistan)).

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