GUNS OR BUTTER: EMPIRICAL ANALYSIS OF BUDGETARY TRADEOFFS BETWEEN DEFENSE AND WELFARE SPENDING IN PAKISTAN

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ABSTRACT

This study empirically examines the tradeoff between defense and welfare spending, namely health and education, in Pakistan. By using time series data from 1995 to 2014 and applying Vulnerability Index and Vector Error Correction Model this study concludes that health expenditure is discriminated in annual budgetary allocation while defense and education is favored. In addition two pairs of tradeoff was found from the empirical results; first between defense and healthcare and secondly between defense and per capita GDP. Finally it was concluded that government financial planners should review their budgetary allocation policy towards defense spending since Pakistan competing with India in the arms race is merely absurd since Pakistan's annual GDP as recent as 2014 was $215 billion and India recently announced an increase in just its defense budget of about $200 billion.

KEYWORDS: GDP, Budget, Defense, Tradeoff

INTRODUCTION

Background of the Problem

A historical but genuine, an ancient but not a bygone debate around the world is that should countries disburse more to weapons or initiate programs serving the nation's interests directly by spending on social welfare programs: a debate called the 'guns vs butter' debate. Those in favor of the arms race argue that military expenditure is in reality a fruitful public investment. The major allocations typically in a developing country's government budget are defense, social spending, debt repayment and infrastructure. Alas due to lack of finances, governments have to make the crucial decision of more of one and less of another, which is termed as tradeoff and the investigation undertaken, is whether defense budget increase leads to a tradeoff in education and healthcare spending. Those against the tradeoff in social expenditure (due to defense) are of the opinion that the main aim of a government is welfare and not advanced weaponry by quoting the 20 plus countries as an example, which do not have an army, yet are safe and secure but the opposing ideologues argue that defense is most important since countries if secure and safe would be able to look after the nation and those without armies are exceptional cases and individual differences always persist.

Thus the argument of Guns vs butter is a very longevous debate since decades. Nonetheless, every time this issue is debated a notion is referred that butter is economic growth. Butter in our view does not merely refer to economic growth but the true determinant of prosperity of a nation is when its people are given better healthcare and education facilities. Zadeh (2009) upheld our view and argues that military spending do not crowd out private sector investment but non-defense public spending. He refers to a concept "redistributive militarism", meaning resources gradually shift from non-military to military spending result in ominous effects.

This is in the shape of resources shifting from the bottom to top, resulting in increased income inequality. In addition, when vital national objectives like slash in formation of new schools, human capital programs and the like are slashed, it leads to a decrease in long term productivity.

Broad Problem Area

On this issue many misperceptions exist in Pakistan among the masses. Many people think that 70% of the National Budget goes to military, untrue! But the reality is an astounding one too and one wonders whether Pakistan is a country with army, or an army with a country. Where it is true that military's share in national budget was excessive in the previous decades, it is also true that Pakistan in 1999 became an atomic country and hence should have slashed its defense spending to divert it to infrastructure and social spending. The situation in 2014-15 revealed that government announced an 11% increase in military budget which jumped from Rs. 700 billion to Rs.780 billion in a bid to compete with the arch-rival India. Nonetheless, Pakistan's total GDP is $243 billion and India in the recent years announced a $200 billion increase in its defense budget, thus Pakistan competing with India in the arms race is simply futile and absurd. If Pakistan wants to outperform India, it should invest in education, healthcare and better infrastructure facilities along with new technology. Statistics reveal that defense gets third or fourth major allocation in national budget in Pakistan and the army even compels the civilian administration to pay their pensions from the civilian budget, which as recent as 2014 equaled Rs.100 billion. So in addition to more than the 780 billion defense budget the armed forces also swallow a 100 billion from the non-defense budget too. Thus it is not biased to say that the allocation to defense department in budget is more than actually reported.

However if we look at the financial health of the army as an institution, Zaidi (2008) reveals that the Pakistan's military institution own more than 23% of the corporate assets of the country [2007 statistics]; International Newspaper THE GUARDIAN reported a figure of £10 billion as their investments' net worth in the same year and Al-Jazeera reported $20 billion as the net worth of Pakistani military's total assets. Yet they finance their pension payments out of non-defense budget and in addition get such massive funds which leave little room for a better infrastructure, healthcare and education in the country.

Specific Problem Statement

Tradeoff between government expenditures is a classic choice of public finance researchers and this study too is focused in this regard. However, the problem statement of this study specifically refers to the view that a change in defense budget fundamentally leads to a change in education and healthcare budgets, which commonly is believed to be a slash. The problem that arises due to such an upshot is that a high defense budget leaves little room for development and welfare which eventually drags a country to higher spells of poverty, malnutrition, unemployment and even crowds out investment from the private sector. Thus, through a vulnerability index and empirical analysis, this study tends to find the effect of defense on healthcare and education spending in Pakistan.

Aim of the Study

This study aims to assess the guns vs butter debate by studying time series data of about two decades. Guns as represented by defense budget while butter by education and healthcare are exerted to find how these three are treated in budgetary allocations and assess whether a change in one leads to an increase, decrease or no effect on the other. In short, this study determines any favoritism or discrimination of these variables in annual budgetary allocations and primarily

finds tradeoff. Thus, from a public finance's perspective this study aims to test these views in Pakistan. If military is getting excessive funds, it surely is trading off many important public finance objectives and this research tends to points out that. If not it is important to arrive at the true picture. But if it does it is important to give the policy implication that when military gets the third highest allocation in budget, finances its massive pensions of over Rs.100 billion from civilian budget and controls more than a quarter of corporate assets of the country, doesn't financial stability require a cut in their financial allocations?

Objectives of the Study

- To determine whether the three variable of this study (defense, education and healthcare) are favored or discriminated in budgetary allocation

- To empirically find the effect of defense spending on national healthcare budget

- To find the effect of defense budget in trading off education spending through empirical test.

The modus operandi of finding these objectives is to initially find how all the variables, namely defense, healthcare and education expenditure is discriminated against or favored in the national budget. After that, tradeoff between defense and welfare spending, i.e. healthcare and education is assessed empirically. The main objective of this study is to find whether an increase in defense spending leads to a decrease, increase or no effect on welfare spending.

Research Questions

- Which of the three budgetary items (defense, education, healthcare) are favored or discriminated against the others in annual budget allocation?

- Does defense spending result in a dwindled healthcare budget?

- Is it true that a higher defense budget results in low education spending?

Delimitation

Coming to the delimitation, this study focuses on the impact of defense spending on national education and public healthcare in trading off these; alas there can be several other factors which will also be traded-off when higher military budgets are announced. The other factors like Public Sector Development Program (PSDP) and employment also measures national welfare but our study is restricted to measuring welfare spending and defense relationship and not beyond that. However, in research one can never reject the work of another; he/she can disagree with it, criticize it but cannot totally reject it if it's done in line with the set standards. In addition, in the world of research there's always a room for novelty and looking at things from a different perspective. Again this research would mention that that this study is not just legible but a rich and prosperous one too, thus will hopefully open new avenues and debate on the said subject.

Organization of the Study

Chapter one of this study introduces the research topic, problem statement, aims and objectives followed by delimitation finally. The second chapter is addressed to defining the important concepts and gap of the study along with a review of past literature that deals with the problem of this study.

Furthermore, chapter three deals with the methodology of this study: the sample size, variable description and the data analysis techniques. After this the fourth chapter announces empirical results and its analysis, followed by the final chapter which sums this study and hence gives conclusion and recommendation.

LITERATURE REVIEW

Concepts and Definitions

Endogenous Variables

- **Defense Expenditure:** Defense expenditure refers to all current and capital expenditure related to the defense department by Government of Pakistan, including the armed forces, their salaries and weaponry etc. It is expressed as a percentage of total government expenditure in the VAR Model and is denoted by DEXP. In addition the source of this variable is Stockholm International Peace Research Institute (SIPRI) which issues historical data of every country's defense budget.

$$DEXP = \frac{Defense\ Expenditure}{Total\ Government\ Expenditure} \times 100$$

- **Education Expenditure:** Education expenditure refers to all spending in education sector by Government of Pakistan in a year, at pre-primary, primary, secondary and tertiary level. It too includes both the development and current sector expenditure, in this case education and is expressed as a percentage of total government expenditure in the regression, denoted by EEXP for which the source was World Development Indicators (WDI) issued by World Bank.

$$EEXP = \frac{Education\ Expenditure}{Total\ Government\ Expenditure} \times 100$$

- **Social Expenditure:** Social expenditure in this study is represented by public healthcare expenditure or the amount of current and development budget spent by the government on healthcare in a year which is expressed as a percentage of total government expenditure too, like the other two variables and is denoted by SEXP for which data is acquired from World Bank data portal and is calculated as follows:

$$SEXP = \frac{Health\ Expenditure}{Total\ Government\ Expenditure} \times 100$$

Exogenous Variables

- **Per Capita GDP:** Per Capita GDP's source is World Bank WDI too, denoted by PCG in regression and it refers to total GDP divided by the total population or

$$Per\ Capita\ GDP = \frac{Total\ GDP}{Total\ Population}$$

- **Change in Total Government Expenditure:** This simply refers to change in total government expenditure in relation to the previous year, and is denoted by CTE in Vector Auto Regressive Model. This variable is taken from WDI like the others except DEXP and is calculated as follows:

$$CTE = \frac{New\ Budget\ Expenditure - Old\ Budget\ Expenditure}{Old\ Budget\ Expenditure} \times 100$$

Identification of the Gap

Various studies have been conducted across the globe on welfare-warfare tradeoffs. Lin, Ali and Lu (2015) found no negative tradeoffs, Oszoy (2002) and Yu Wang (2014) found tradeoff between defense and social spending, namely healthcare and education. Moreover there are also studies like Hess and Mulan (1988) and Frederinksen and Looney (1994) which lack empirical evidence of tradeoffs. Thus there are wide variations in research and in the context of Pakistan researchers tend to focus on the impact of Defense spending impeding economic growth. In addition, researchers historically focus on the impact of budgetary tradeoff between defense spending and various development indicators like infant mortality, beds per 1000 people, percentage of population access to sanitation and clean water, like William Easterly (2001). Nonetheless, researchers have paid no particular heed of the impact of budgetary tradeoff between defense, education and healthcare spending and this gap acted as the main motivation behind this research. Consequently, this research tends to find two things:

- Measure the vulnerability (discrimination against each other) of each type of expenditures (defense, healthcare and education) employed.

- Secondly the tradeoff in healthcare and education budget due to a change in defense budget.

One argues that this is a development economics related issue and economics, development and sociological researchers should look into this area. The reality however, is that this area needs exploration and analysis of a Public Finance perspective too; Public finance is not just about managing government expenditure and revenues but it's role also includes the adjustment of one or the other (revenues and expenditure), to achieve desirable effects and avoid the undesirable ones.

Literature Review highlighting the Variables of Interest and their Relationship

Dune (1996) researched the effect of military expenditure on growth. This study summarized the results of 54 other researches and concluded that military spending does not have any significant effect on economic growth of the country. However it might affect the economic growth negatively. Smith argued that all the researches which have measured the effect of military spending on economic growth, none of those studies found negative nor a positive relationship of military spending to economic growth. The study studied the relationship of defense and growth. This study concludes that the effect of defense spending varies across countries. The countries with lower per capita income experienced higher negative effects of defense spending.

Ozsoy (2002) undertook a research and tests the tradeoff in defense-education and healthcare in Turkey from 1925-1998. By assessing past literature this study too highlights like all the above that in the case of tradeoff between defense and other budgetary items wide variation is found. This is due to the fact that different countries have different situations and what is true for one may not be for another. In addition, researchers usually take cross sectional data but due to different conditions in each country this creates a bias and time series instead should be used. Also the literature highlighted that usually in developing countries military budget shrinks the finances available for other budgetary items and if a negative relationship exists between defense and others, it leads to dwindling economic growth. Alas the true measure of economic growth can be assessed by the quantity and quality of workforce of the country or in fact the whole population; and that too in terms of trainings they get, the skills they acquire and their Human Development Index etc. Thus the researchers employ health and expenditure as their testing variables against defense instead of the conventional

economic growth. By using a single equation, and time series data the researchers employs an OLS regression of data from 1925-1998 to test whether defense spending impedes healthcare and education expenditure and found a negative relationship henceforth.

The research was a novel one in a sense that it had a vast sample size and got more directed results. The researcher implied that governments while announcing budgets should focus on these findings, as human capital forms the basis of future economic growth and efficiency.

Moreover, Zadeh (2009) conducts research on United States of America, an OECD country and tests the claim that military spending results in slashed non-military expenditure. The researcher begins by highlighting the concept Military Keynesianism, which refers to the assumption that a large military budget increases economic growth, as many businesses are given contracts and households get jobs. With this discourse the author says that proponents of large defense budget justify the enormous budget of Pentagon- which as per the 2008 statistics is the largest component in their national budget, and larger than military budgets of the entire world combined. Although the researcher sums that military spending do not trades off private investment as is the common perception but upheld the view that when resources shift from military to non-military areas, it creates income inequality, there is lack of new healthcare and educational ventures and the current are not upgraded which result in less efficiency in future. The researcher sheds light on the fact that US military spending is larger than GDP of all the 47African countries combined and asserts through his analysis that defense expenditure leads to a tradeoff in non-defense spending excluding private sector investment. The slashed programs are infrastructure projects, formation of new schools, hospitals, dams or in short, all the human and physical capital formation projects.

Due to this the author hints that income inequality stings on the verge of acceleration; this is due to the 'redistributive militarism', meaning the shift from non-defense to defense expenditure leads to devastating effects by shifting resources from bottom to top resulting in income imbalance. Thus this setback hurts public capital formation, be it human or physical. In addition, the researcher asserts that military expenditure increase result in detrimental socio-economic consequences like the destruction of the city of New Orleans in 2005 due to a natural disaster. Although it was a national disaster but lack of finances for calamities and turning a blind eye to the predictions led to the multiplied destruction. Although the researcher does not conduct any empirical analysis but there is ample evidence through trends, graphical analyses etc. to support this view.

Kollias and Paleologou (2011) assert that defense spending is regarded as a burden on national exchequer and its impact on other budgetary outlays is subject of many studies, like Ozsoy (2002), Apostolakis (1992); and those lacking empirical evidence of tradeoffs like Frederinksen and Looney (1994); and those having mixed findings Yildirim and Sezgin (2002) and Harris, Kelly and Pranowo(1988). However, no particular, distinct and specific attention has been given to the impact of defense expenditure crowding out other budgetary items and this acted as the main motivation of their study. Consequently, the gap found looked the tradeoff between national defense, healthcare and education expenditure in Greece. First, the said research tried to find out which budgetary items is being discriminated against each other and by using the Hicks and Kubish (1984) methodology called Vulnerability Index, vulnerability between each of the three items is assessed. Thus it was found that in the budgetary allocations all three of the items are discriminated. Moreover, for finding tradeoff the VAR Model was applied, where GDP per capita and growth rate of central government was added as exogenous variables.

Finally, the results highlighted two cases of tradeoffs: one between defense and education expenditure and secondly, between defense and social expenditure.

In both the cases it was revealed that defense expenditure grows by a greater percentage when budgetary allocations are done, as compared to social and education expenditure. Also a negative relation was found in the cases of exogenous variables. Per capita GDP held negative relationship with all the expenditures, indicating that when income level rises potentially less finances are allocated to these expenditures. Whereas, growth of central government expenditure held a negative relationship too, indicating when government budget expenditure rises less resources are allocated to defense, social and education expenditure and that neither are discriminated against defense in budgeting. This is in line with their earlier findings of Vulnerability Index.

Moving ahead, Shahbaz, Afza and Shabbir (2013) confirms our research gap above and tests effects of military spending in relation to impeding economic growth in Pakistan and sums up that both have a negative relationship. As mentioned earlier in the research gap that numerous studies have tested the tradeoffs between defense and other budgetary items in the context of Pakistan but not welfare spending. By assessing various past studies on guns vs butter, the researchers too agree like this study that there is wide variation in results and in the context of Pakistan minimal attention is given to it, although it is of immense significance. Thus, their study investigates the effects of military spending on economic growth both in the short and long run. In their study the Auto Regressive Distributive Lag is applied to test cointegration between the variables. Finally the Vector Error Correction Model was applied to assess causality between military spending and economic growth over the duration 1972-2008. After the tests were applied a unidirectional causality was found between defense and economic growth. Thus, the arms race does affect the provision of butter that in this case is economic growth. Finally after tallying that the results are consistent with the findings of Khilji and Mahmood (1997), Tang (2008), Keller et. al (2009) etc., the researcher gave the policy implication that both the nuclear states Pakistan and India are engaged in the arms race, they're the most strategic countries in South Asia and can only outperform if they give attention to their level of poverties, slash defense budget and invest heavily in physical and human capital. Furthermore, in the context of specifically Pakistan the policy implication addressed was that the defense spending in Pakistan is also higher due to the unrest in FATA and terrorism, and this can be much efficiently managed if government invest heavily in infrastructure, healthcare, education and create employment opportunities. This is due to the fact that these problems arise in areas where per capita income is low and government needs to address that to curb unrest in tribal areas and terrorism. Summing the review of this research, it is notable to mention that this research undertaken by us is in lieu of the policy implication just mentioned above. Our study goes beyond the conventional barriers and defined butter as healthcare and education like Kollias and Paleologou (2011) and hopefully will open new avenues of debate and novelty in this area.

Aaron and David (2013) examine and signify that defense spending affects or in other words restricts the public health spending of an economy. Under this study the authors observes data from 1980-2010, and includes all OECD countries. This study finds weak but reasonable evidence that defense spending crowd out the public health expenditures, both in short and long run. This study uses a notion provided by preceding studies, to observe the highly industrialized nations for such effects and reports a positive and significant relationship between military spending and public health expenditures. Furthermore, the study reports governments allocate budgets in a systematic way that balances the resources that are exploited on security or to pay economic debts (i.e. these resources are mostly or primarily the public resources).

This study also provides the evidence from Israeli economy, under produces unique results than other samples; the health and defense expenditure of the economy is purely significant and are correlated is a positive manner. This further provides evidence that conventional theories and approaches that are mostly prescribed by previous studies are not the only case concerning this subject, although one criticism provides an evidence for such positive relationship between health and military expenditures. Under the Israeli economy, the health expenditure consists of the small portion of the economy as compared to military expenditures. The country has a high perceived security threat and high level of public debt, they argue, necessitating first covering these costs then allocating what remains as 'primary civilian' funds.

Malizard (2013) conducted a study in which an attempt was made to fill the gap with empirical evidence new to the literature which evaluated authority of military expenses on the unemployment rate from the period 1978-2008. The study attempted to calculate the relationship between defense and unemployment, utilizing an ad hoc model. This model tests by controlling other variables tests the impact of military expenditure on the unemployment. The study concluded that for different series the order of integration is not the same. The result provides reason that it is important to utilize the appropriate estimation technique. The study further concludes that the historical belief regarding cuts in budget spending will lead to unemployment is mistaken and flawed. The study suggests that defense-unemployment relation requires further examination.

Yu Wang (2014) examines the guns and butter argument in the context of China and tests whether tradeoff exists in defense and welfare spending in China and if it does is it positive or negative. By employing data of 1952 to 2006, the researcher employs VAR model to test for tradeoff. The current study advances the current military spending literature by demonstrating a vital instance of a negative guns–butter tradeoff in the Third World. The literature strongly recommends fiscal adjustment favorable to military spending but the results suggest otherwise. It is also said that defense spending leads to use of advanced technology and hence economic growth but still when China has a high defense budget it is experiencing high spells of poverty and the policy implication is thus given that in times of recession defense should not be favored. Also, findings of other developing nations, suggests guns vs butter debate is a country specific case. This study is significant in a manner that it provides material definition of existence of trade-off between war and welfare tradeoff in China's budgetary allocations. The respective study utilizes VAR model and hence concludes that defense expenditure leads to a tradeoff in social expenditure in China.

Lin, Ali and Lu (2015) scrutinizes the relationship between military expenditure and social welfare spending of 29 OECD countries from 1988 to 2005 by employing the Generalized Method of Moments method to test the guns-and-butter argument. Their article reports a positive relationship between defense spending and social welfare expenditure, namely healthcare and education. At start of their literature assessment they refer to the ground breaking study of Russett (1969) in which defense, healthcare and education expenditure data of USA, France and UK was studied. The researchers found strong negative tradeoff between defense and health and education expenditure. Eric et. al (2015) however, negated this view and had a completely different opinion. They concluded that as per their study on the 29 OECD countries, when defense expenditure increases, health and education increase too or in short a positive tradeoff. However, a distinct point in their research is that OECD countries are more supportive of welfare programs and are developed states, thus when they increase military budgets, the government also uplift spending on education and healthcare. The other reason this study gave of a positive tradeoff is that defense expenditure creates human capital formation, since soldiers and even the non-combat defense department staff are well taken care of and well trained, so if government decides to increase

finances of defense they may increase of healthcare and education too. Nonetheless, this view of the researchers is merely an observation and they did not give any theoretical or empirical justification of this claim.

Moving ahead, Pakistan faced detreating resource situation in 1988 that resulted in financial crises. The deficit reached 8.5% of Gross Domestic Product (GDP). Inflation increased and the current account deficit increased by 4.3% of Gross National Product (GNP). Moreover, the external debt services ratio was roughly 28% of export earnings and foreign exchange reserves were cut in half to USD 438 million, the amount is equal to three weeks of import. The situation had forced Pakistan's economy to enter into various economic agreements with IMF, the World Bank, Asian Development Bank and other private donor agencies and institutions. The sole purpose of these diverse nature contracts was to implement new policies, with mid-term adjustments and structural reform programs that intended to restore the balance in economic resources to optimum levels. The ultimate purpose of these policies was to increase the economic efficiency of Pakistan. Peter C. Frederiksen and Robert E. Looney (1994) highlights two possible constraints that has affected the Pakistan's economy during 1998 due to these developments; narrow tax constraints and military spending or expenditures. Under this study the researcher examined the time period of 1973-1986, and produced analysis for short-run effects and long-run adjustments model to observe the overall effects on Pakistan's budget, that had happened due to high defense budget allocation. The defined period analysis indicated that Pakistan's economy had been affected by various structural problems that included feeble public resources and public resource positioning of these resources. In addition, the study further indicates that the military expenditure, debt and deficit services are interrelated at various levels by using a complex mechanism that limits studies to predict the effects of military spending on government budget programs, in the short-run. Furthermost, the model used by this study signifies the priority of social programs than economic services. This is simply because of the rationale provided by similar studies that when the military spending are increased the government tends to utilize resources from infrastructural programs.

Moreover, Ying, Xiaoxing, Jiaxin and Rui (2016) provided significantly large contribution of the effects of military expenditure on the economic growth. The results of this study show that there were no significant effects of military expenditures on the growth of the nations. Most of the studies that are being utilized in this research indicate the same notion but on other hand the relationship between military expenditure and other categorized expenses do possess significant tradeoffs, especially in the case of public health expenditures.

In similar contrast the researcher provides a supporting view for this study and examines the effects of military spendingon social welfare; that is mostly a controversial issue around various researchers. Under this respective study the author tends to find the effect of military spending on social welfare of the economy in both input, output and under the efficiency perspectives and finds that military spending typically promotes social welfare of the nation as whole. This study exploits the power of FMOLS estimation tools to predict the relationship between military expenditure and social welfare of the nation, however, the empirical analysis and comparative analysis of the selected sample of this respective study indicates that military spending is capable of promoting and enhancing the welfare activities of an economy. In addition, the researcher provides two dimensions of this study; first, a broadly Keynesian framework provided a view that excess military spending can stimulate the optimum level of social welfare of an economy and increase the overall aggregate demand. Second, due to government budget constraints, the rise of military expenditures may share diverse effects of social welfare of an economy and this can only overcome the reducing the non-military spending of an economy. In similar contrast Caputo (1975) asserts that increase in defense and military spending of an economy can

stimulate and boost the overall tradeoffs between several categorical expenses. However, it does provide significant empirical evidence that defense expenditures do not cause significant effects in general public expenditures and public health expenses of an economy.

The researcher tests the debate of defense spending promoting welfare spending. Their modus operandi involves testing this notion both in the developed and the emerging world. For the former, this research includes G7 countries and for the latter BRICS countries. Their findings involve three things: first that the empirical tests reveal military spending influences welfare spending in a favorable way but on the other hand, it affects income levels and increase income disparity. Secondly, military spending have a favorable impact on health and education in developed countries while negative in developing countries and finally, the spending on defense as mentioned earlier affects both income levels and income disparity but the favorable impact on income is more than increase in poverty, i.e. income disparity. Thus, in short, this research concluded that defense spending improves welfare spending.

Yin et al. (2016) concludes that military spending are capable of promoting social welfare of economies and further adds that results are more robust in highly industrialized economies, BRICS and G7 panel. The effect of military sponginess affects the social welfare in terms of income and income inequality. Second, similarly as social welfare data, military spending effect sly influences prosperity additionally, preparing utilizations in made countries. Besides, inspiration response results show that an extension in military spending could enliven the advancement of social welfare utilizations in made countries, while the effect is negative and shorter in creating countries. Third, with respect to social welfare yield, military spending manufactures the pay level and compensation awkwardness. In any case, the effect of military spending on compensation is a great deal more grounded than its effect on the level of pay difference; in this way, we can conclude that military spending may over the long haul advance social welfare. In like manner, the inspiration response results show that speedy third to the degree social welfare yield, military burning through amplifies the pay level and pay contrast. In any case, the impact of military spending on pay is extensively more grounded levels of the economy.

RESEARCH METHODOLOGY

Sample Selection

The sample selection of this study is 20 years i.e. 1995 to 2014 and the total variables combined adds to 95 observations, based on annual data of each variable. The variable defense expenditure (expressed as a percentage of total government expenditure) is taken from Stockholm International Peace Research Institute (SIPRI) database; whereas the time series data of GDP per capita in Purchasing Power Parity, national health expenditure (expressed as a percentage of total government expenditure) and change in total government expenditure is extracted from the data portal of World Bank. In addition, UNESCO Institute for Statistics database provided data of education expenditure (this too expressed as a percentage of total government expenditure).

Data Analysis Techniques

Vulnerability Index

Initially, a methodology by Hicks and Kubisch (1994) is used which measures the vulnerability (discrimination against each other) of each type of expenditures (defense, healthcare and education) employed. This methodology gives information about changes in the size of each category of budget item in relation to changes in the entire budget and cannot be used to search for trade-offs between them.

It is important to note that this methodology is based on an index Vj which calculates the extent to which an item in a budget is discriminated or favored. The index is given below:

$$Vj = \frac{e_j}{E}$$

Where Vj represents vulnerability index, ej represents percentage change in the budget allocations of sector j (defense, education and health spending) and E indicates percentage change in the overall size of central government expenditures.

Moreover, for E>0, if Vj>1, then sector j is being favored and for E<0, sector j is favored if Vj<1, or if ej and E move in the same direction or Vj<0, if ej and E move in the opposite directions. But if ej=1, then sector j is being neither favored nor discriminated against in budget allocations and in all other cases, sector j is being discriminated against in budgetary allocations.

Vector Auto Regressive Model

The following three equation VAR Model is used to find tradeoff- the primary objective of this study. The equations tested in VAR are of Kollias & Paleologou (2011) which are originally of Verner (1983), where GDP per capita and growth rate of Federal Government overall budget are included as exogenous variables, as recommended by Sims (1980) and Doan (1992)

$$DEXP_t = \propto_1 + \sum_{I=1}^{k} \beta_{1,i} (DEXP)_{t-i} + \sum_{i=1}^{k} \gamma_{1,i} (EEXP)_{t-i} + \sum_{i=1}^{k} \delta_{1,i}(SEXP)_{t-i} + \varsigma_{1,i}PCG_t + \theta_{1,i}CTE_t + \varepsilon_{1,t}$$

$$EEXP_t = \propto_2 + \sum_{I=1}^{k} \beta_{2,i} (DEXP)_{t-i} + \sum_{i=1}^{k} \gamma_{2,i} (EEXP)_{t-i} + \sum_{i=1}^{k} \delta_{1,i}(SEXP)_{t-i} + \varsigma_{2,i}PCG_t + \theta_{2,i}CTE_t + \varepsilon_{2,t}$$

$$SEXP_t = \propto_3 + \sum_{I=1}^{k} \beta_{3,i} (DEXP)_{t-i} + \sum_{i=1}^{k} \gamma_{3,i} (EEXP)_{t-i} + \sum_{i=1}^{k} \delta_{1,i}(SEXP)_{t-i} + \varsigma_{3,i}PCG_t + \theta_{3,i}CTE_t + \varepsilon_{3,t}$$

In the equation the variable DEXP stands for defense expenditure, EEXP education and SEXP social expenditure (represented by public healthcare). All these variables are expressed as a percentage of total federal government expenditure. In addition, two variables PCG and CTE which are included as exogenous variables stand for GDP per capita and growth rate of federal government expenditure, respectively.

Nonetheless, for applying the VAR model, this study first checks whether the data is stationary or not, and for that applies Augmented Dickey Fullers and Phillips Peron, unit root tests. Following this, if the time series is found to be stationary, this study proceeds to check for cointegration among variables and based on the results will apply VAR or Vector Error Correction Model, as suggested by Shahbaz et. al (2013).

EMPIRICAL RESULTS AND ANALYSIS

Vulnerability Index

Vulnerability index allows whether any budgetary item is favored or discriminated against in total budgetary allocations and hence do not account for the tradeoff aspect, which is the primary aim of this study. As mentioned earlier the sample of the study ranges from 1995 to 2014 which was easily available on the data portals of SIPRI and World Bank. However, in the case of Vulnerability Index absolute values for all the primary variables were needed which was a

daunting task and the Ministry of Finance (MOF) website was the only source of such data, i.e. the national budget statements. Nonetheless, the MOF website had data of 7 years which is used in calculation of the index, which gave the following results:

Table 1: Index of Preferences given to Expenditures - 2009-2015

Education Expenditure	
Vj	6.121237736
Ej	0.565178457
Social Expenditure	
Vj	0.739119618
Ej	0.068243467
Defence Expenditure	
Vj	13.77884804
Ej	1.272211342
E	0.092330748

However, before looking at the results it is important to remind what the rule of thumb methods of the Vulnerability Index are. It says for E>0, if Vj>1, then sector j is being favored and for E<0, sector j is favored if Vj<1, or if ej and E move in the same direction or Vj<0, if ej and E move in the opposite directions. But if ej=1, then sector j is being neither favored nor discriminated against in budget allocations and in all other cases, sector j is being discriminated against in budgetary allocations.

Hence, based on the assertion, the above results indicate E>0 and the Vj index for social expenditure is less than 1 which means social expenditure is discriminated in budgetary allocations. Nevertheless, the Vj index for both education and defense is greater than 1, indicating both these are favored in budgetary allocation. Although both education and defense are favored but the greater number i.e. of defense indicates it is massively favored.
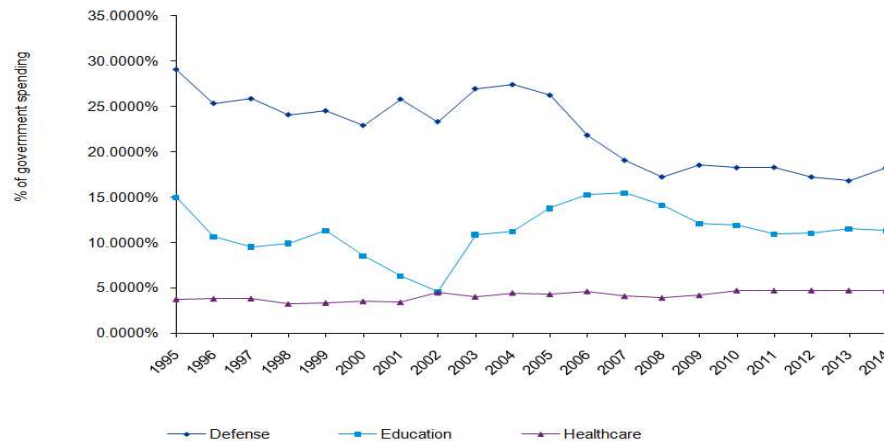
Figure 1: Graphical Representation of Variables

Unit Root and Co integration

Table 2: Augmented Dickey Fuller Test

Variables	DEXP	EEXP	SEXP	PCGDP	CTE
ADF Test Statistics	-1.3378	-2.1437	-1.5460	0.7848	-2.9788
Levels (Critical values)					
1%	-3.831511	-3.831511	-3.831511	-3.831511	-3.831511
5%	-3.029970	-3.029970	-3.029970	-3.029970	-3.029970
10%	-2.655194	-2.655194	-2.655194	-2.655194	-2.655194
ADF test statistics	-3.714285	-3.965945	-5.979625	-3.341319	-5.972291
1st Difference (Critical values)					
1%	-3.857386	-3.857386	-3.857386	-3.857386	-3.857386
5%	-3.040391	-3.040391	-3.040391	-3.040391	-3.040391
10%	-2.660551	-2.660551	-2.660551	-2.660551	-2.660551

*At 5% significance level null hypothesis is of a unit root is rejected

Table 3: Phillips Peron Test

Variables:	DEXP	EEXP	SEXP	PCGDP	CTE
Adjusted Test Statistics	-1.378358	-2.349271	-1.47221	0.687484	-2.956513
Levels (Critical Values)					
1%	-3.831511	-3.831511	-3.831511	-3.831511	-3.831511
5%	-3.029970	-3.029970	-3.029970	-3.029970	-3.029970
10%	-2.655194	-2.655194	-2.655194	-2.655194	-2.655194
Adjusted Test Statistics	-3.718733	-3.965945	-5.979625	-3.286536	-6.223966
1st Difference (Critical Values)					
1%	-3.857386	-3.857386	-3.857386	-3.857386	-3.857386
5%	-3.040391	-3.040391	-3.040391	-3.040391	-3.040391
10%	-2.660551	-2.660551	-2.660551	-2.660551	-2.660551

*At 5% significance level null hypothesis is of a unit root is rejected

The results of unit root tests in table2 and table3 reveal that null hypothesis of a unit root is accepted for all the given variables at 5% significance level at levels, in both the ADF and Phillips Peron test. This indicates that all variables is non-stationary. Therefore, the 1st difference was taken and the results of both the tests concluded that the data of all five variables (Defense expenditure, education expenditure, social expenditure, per capita GDP and change in federal government expenditure) become stationary at 5% significance level at 1st difference and hence null hypothesis of a unit root is rejected.

Moving on, the variables which have a unit root at levels are tested for co integration and out of the two methods of co integration the Engle-Granger two step method and Johansen test, this study undertakes the latter, as suggested by Kollias and Paleologou (2011), asserting that since the data is non-stationary and also measured by OLS, the Johansen Maximum-Likelihood (JML) method is recommended. Thus, the results of co integration reveal results mentioned in table 4 below:

Table 4: Co integration Test

Unrestricted Co integration Rank Test (Trace)				
Hypothesized		**Trace**	**0.05**	
No. of CE(s)	**Eigenvalue**	**Statistic**	**Critical Value**	**Prob.****
None *	0.958708	118.3294	69.81889	0.0000
At Most 1 *	0.884956	64.14899	47.85613	0.0007
At Most 2	0.570437	27.38749	29.79707	0.0925
At Most 3	0.426897	13.02270	15.49471	0.1140
At Most 4	0.188890	3.558972	3.841466	0.0592
Trace test indicates 2 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized		**Max-Eigen**	**0.05**	
No. of CE(s)	**Eigenvalue**	**Statistic**	**Critical Value**	**Prob.****
None *	0.958708	54.180440	33.876870	0.000100
At most 1 *	0.884956	36.761510	27.584340	0.002500
At most 2	0.570437	14.364790	21.131620	0.335800
At most 3	0.426897	9.463723	14.264600	0.249600
At most 4	0.188890	3.558972	3.841466	0.059200
Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

Although the variables in unit root tests became stationary at first difference but as a rule cointegration is always done on values at levels. Thus the results of cointegration tests reveal two cointegrating equations. Initially, the results show in two cases the trace statistics are greater than the 5% critical values; secondly, the two instances in the latter table also indicate Max-Eigen values are greater than the critical values at 5% level. Hence, cointegration in this series exist since it is a rule of thumb method that in cointegration tests when critical values are less than the trace statistics and the Max-Eigen statistics co-integration exist. Summing this, analysis the results show there exists long run relationship among the variables.

Therefore, Vector Auto Regression test cannot be applied since it is done for non-cointegrated results and consequently, the Vector Error Correction test will be applied to find tradeoff: the primary objective of this study.

Vector Error Correction Model

Table 5: Vector Error Correction Model

	Coefficient	Std. Error	t-Statistic	Prob.
CointEq1	-1.089589	0.397134	-2.743627	0.033600
D(DEFENSE(-1))	0.267987	0.348091	0.769876	0.470600
D(DEFENSE(-2))	0.428404	0.290947	1.472447	0.191300
D(EDUCATION(-1))	-0.140836	0.212842	-0.661691	0.532700
D(EDUCATION(-2))	-0.219356	0.224289	-0.978005	0.365800
D(HEALTHCARE(-1))	-5.635352	2.331670	-2.416873	0.052100
D(HEALTHCARE(-2))	-1.087487	1.264500	-0.860013	0.422800
C	1.784136	0.570088	3.129581	0.020300
CTE	-0.040768	0.065237	-0.624931	0.555000
PCGDP	-0.035284	0.009039	-3.903666	0.008000

Table 5: Contd.,	
R-squared	0.857430
Adjusted R-squared	0.643575
F-statistic	4.009401

The results of Vector Error Correction Model show that there are two pairs of negative tradeoff. The first is between defense and healthcare expenditure and a 1% increase in defense leads to a 5.6% decrease in public healthcare budget. Besides this, the second pair of tradeoff is between defense and per capita GDP and a 1% increase in defense expenditure leads to a 0.03% decrease in per capita GDP. The finding of defense and healthcare tradeoff is in line with the earlier findings in Vulnerability Index which concluded that healthcare expenditure, denoted by social expenditure (or SEXP) is discriminated in annual budgetary allocation.

CONCLUSIONS

Budgetary tradeoff has attracted the energies of many researchers, but in the context of Pakistan slight attention is given to tradeoff between defense and welfare spending. Though the debate of guns-butter is longevous but researchers tend to define butter simply with economic growth alas this study has gone beyond the traditional definition and represented butter with health and education. In this regard, this study aimed to find how the three primary variables of the research are treated in annual budgetary allocation and after that find what a change in defense spending does to health and education. Thus by using a vulnerability index and vector error correction model this study concludes that defense and education are favored in budgetary allocation, while healthcare is discriminated. In addition, the VECM results show that an increase in defense spending leads to a decrease in healthcare spending and per capita GDP of Pakistan. These findings are consistent with research of Shahbaz et. al (2013) which too tests the guns vs butter argument and concluded that increase in defense spending is detrimental to economic growth. Summing up, this study hopes that our findings will open new avenues of research in the said subject and future research will be contributed to more budgetary items which are traded off due to defense spending.

RECOMMENDATIONS

As indicated by the findings of this study and many others, the ever increasing defense spending is detrimental to growth and progress and government plus its financial planners need to seriously consider this fact. If the case of Pakistan is highlighted, each year defense budget is favored in budgetary allocation (as witnessed by vulnerability index too) and in the year 2014-15 Pakistan increased her defense spending from 700 billion to 780 billion in a bid to compete with her arch rival India. Nonetheless, the fact is that Pakistan's total GDP is $215 billion and recently India in her defense budget alone announced $200 billion increase. Thus Pakistan should divert her resources to more fruitful areas and specially after her becoming a nuclear country, it needs to decrease her spending on the traditional bid of arms race.

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