ECONOMIC GROWTH IN RELATION TO DEFENCE EXPENDITURE, EXTERNAL DEBT AND FOREIGN AID (A CASE STUDY OF PAKISTAN)

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Abstract:
This study explores the relationship between Defence expenditure (DE), external debt (ED), economic growth (GDP), foreign Aid (AID) and Development (DEV) in Pakistan from 1960 to 2016. World Bank data base has been used for standardisation and acceptability. This research is a combination of multivariate cointegration and Granger causality analysis for DE, ED and GDP. However for trend analysis two additional variables i.e. AID and DEV have been added to the model, the results have been matched. Johansen and Juselius' multivariate cointegration analysis and trend analysis indicate the presence of a long-term relationship between the DE, ED and GDP. All variables have strong positive relationship. Variance decomposition analysis suggests that the GDP is positively affected by DE and ED, however trend analysis indicates strong but negative relationship of ED with DE and GDP both. Other two variables i.e. AID and DEV do not have relationship with DE, ED and GDP, however trend analysis indicates a weak positive and long term relationship between the two. The trend analysis suggests that after 2030 ED is likely to be more than GDP and DE, therefore policy makers may be aware of this eventuality and look for a long term economic policy and adoption of PPBES (Planning, Programming, Budgeting and Evaluation System) for long term policy planning. The system may be studied in detail to guard against occurrence of any such eventuality. Moreover due diligence/ caution be exercised while negotiating any long term external loans, as it has a direct bearing the economic outlook by 2030.

Key words: 6 to 9 words. Italics, Times New Roman 10, justify, line spacing 1. Leave one line below the abstract and two blank lines between the key words and the introduction.

1.Introduction

This paper focuses on the unique relationship between Economic growth, Defence Expenditure, External Debt, Foreign Aid and Development in Pakistan from 1960-2016. The trigger for this research has been traditional debate in Pakistan and around the world that retardation in economic growth of Pakistan is the result of continuous and increased expenditure on Defence. It's a fact that Pakistan is maintaining a comfortably large fleet of Armed Forces including nuclear arsenal, owing to geographical complications, involving on the war against terror and to guard frontiers. Due to a host of reasons Pakistan has remained under pressure from world powers and economic sanctions for long, however after becoming a frontline ally in war on terror and part of coalition support forces in Afghanistan, Pakistan managed to find a justification of maintaining a Armed Forces. It continues to be target of terrorism itself, thereby having adverse effects on its economy, discouraging FDI and cooperation in other sectors by foreign investors. Despite all the odds, the modernization and up gradation of military hardware is on the go and Pakistan has been successfully managing all the advancement out of its integral financial resources,

ECONOMIC GROWTH IN RELATION TO DEFENCE EXPENDITURE, EXTERNAL DEBT AND FOREIGN AID
(A CASE STUDY OF PAKISTAN)

having a look at defence expenditure reflects that increased from US$ 4,039 Million in 1988 to US$ 10,063 Million i.e. 2500% increase in 29 years[1] (SIPRI, 2016).

Along with increase in Defence Expenditure, external debt and GDP have also been on the rise, despite Budget Deficits. External debt was US$ 16.96 Billion in 1988 whereas it was US$ 82.98 Billion in 2017 i.e. increase by 492% (World bank, 2017)[2]. Despite a known fact that in Pakistan Budget deficit has been continuously on the rise as was Defence budget so the question arises as to what was the source that brought in the additional capital to fund defence needs of Pakistan, does foreign funding play some role in funding defence expenditure?

1. Problem Identification and Statement
1.1 Problem Identification

1. Pakistan's defence Budget has been under scrutiny as well as criticism by international media and lending agencies. In a recent article Pakistan's border clashes with India were eyed as a pretext to boost Defence Budget and it was commented that military has been taking a disproportionate amount of the cake at the expense of country's education and health (Kamran, 2017)[3]. Pakistan's persistent deficit budgeting, continuous inflow of foreign aid/ funding and Pakistan's pursuance an aggressive nuclear program with a comfortable fleet of Armed Forces. It was pointed out by Israeli military intelligence chief Amos Yadin in 2013 when he spoke to press that "Pakistan has already been paid by Saudis to deliver atomic weapons anytime". To this news report there was an official clarification from Pakistan's foreign office spokesman Aizaz Chaudhry calling the report and statement by Israeli military intelligence chief as totally baseless[4].

2. One clue for funding the military programs in Pakistan is the US aid pouring in since 1948, Pakistan has received around US $ 30 billion in direct aid from United States utilising half of this on military programs (Susan B. Epstein, 2012)[5], however a careful analysis would reveal that 50% of the total US aid i.e. around US$ 15 billion in 66 years is not a considerable amount which could fund such a large military program.

3. Jim O'Neil, a famous economist; stated that Pakistan has the potential to become the 18th largest economy in the world by year 2050. He also commented that Pakistan is the 44th largest economy with a GDP of US$ 225.144 billion in 2013 and has the potential to touch US $ 3.33 trillion by year 2050[6] (Dawn, 2012). Contrarily Bretton woods project report states that Pakistan has been the largest recipient of the IMF loan

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[1] Stockholm Institute of Peace Research Institute (SIPRI), Pakistan Military Expenditure, "https://tradingeconomics.com/pakistan/military-expenditure, accessed on ((SIPRI), 2017) 23 October 2017.

[2] World bank, Economic Indicators, https://data.worldbank.org/country/pakistan?view=chart, accessed 23 October 2017.

[3] Border Clashes Seen to Force Pakistan Defense Spending Boost, Bloomberg Politics, Kamran Haider and Ismail Dilawar, (Dilawar, 2017) "https://www.bloomberg.com/news/articles/2017-05-24/border-clashes-seen-forcing-pakistan-to-boost-defense-spending, accessed on 23 October 2017.

[4] Saudi nuclear weapons 'on order' from Pakistan, Mark Urban, http://www.bbc.com/news/world-middle-east-24823846, accessed on 23 October 2017 (Urban, 2013).

[5] Pakistan: U.S. Foreign Assistance, report, July 28, 2011. Epstein, Susan B. & Kronstadt, K. Alan. https://digital.library.unt.edu/ark:/67531/metadc93879/citation/#cite, accessed 23 October 2017. (Epstein, 2011).

[6] Pakistan can become world's 18th largest economy by 2050,"https://www.dawn.com/news/1081336", accessed on 23 October 2017. (ó'Neil, 2014).

for the longest period of receiving in the last 29 years, today the external debt of Pakistan stands at US$ 82.3 billion (Tradingeconomics, 2017)[7]. Pakistan has been under strong scrutiny of IMF, which controls the tax regime in Pakistan, IMF taxes retard the economic growth and hit the middle to poor class and moreover Pakistan's debt repayment has risen to 20% of the export revenues[8]. Continuous reliance on external Debt, rising Defence Budget and Economic growth do have some linkages, which needs to be explored.

1.2 Problem Statement.

Though Pakistan's budget deficit has been reduced to 3.8% in 2017 from 8.8% of GDP in 2012 (World Bank, 2017)[9], but continuous decline puts the country in a situation to rely on external borrowing; foreign aid has been coming to Pakistan for years but the development across the country do not reflect any meaningful use of the aid. However Pakistan's military expenditure (non productive expenditure) kept on increasing, despite all this Pakistan's stock market reached the historical levels during year 2017. This scenario leads to a possibility of long/ short term relationship between External Debt, Military Expenditure and Economic Growth, that requires some consideration.

1.3 Research Questions

1. Does there exist a relationship (long/ short term) between Defence Expenditure and Economic growth in Pakistan?
2. Does Defence Expenditure indirectly contribute towards Economic growth of Pakistan ?
3. Whether External Debt and Economic growth have some long/ short term relationship in Pakistan ?
4. Does Defence Expenditure have long or short term relationship with External Debt in Pakistan?
5. Whether development funds taken from foreign agencies are diverted to fund non development Expenditures in Pakistan e.g. Defence Spending or it affects Economic Growth ?
6. Is there some triangular linkage between External Debt – Defence Spending and Economic Growth in Pakistan?
7. Does Development in Pakistan correspond to the foreign aid pouring in for development purpose?

1.4 Significance of the Study.

The study will help to contribute towards bridging the gap in the body of knowledge by identifying a linkage between External Debt-Defence Expenditure, Economic Growth, Foreign aid and development. It will significantly figure out relationship between the variables, this study is expected to provide a platform towards studying the trends and forecasting through the eyes of Defence Expenditure, in turn contribute towards making long term economic policies.

1.5 Research Objective.

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[7] Pakistan Total External Debt, Trading Economics, https://tradingeconomics.com/pakistan/external-debt, Accessed 21 October 2017, (Economics, 2017)

[8] Financing burden of CPEC, Dawn Newspaper, https://www.dawn.com/news/1313992, Accessed 21 October 2017, (Hussain, 2017)

[9] World bank, Economic Indicators, https://data.worldbank.org/country/pakistan?view=chart, accessed 23 October 2017.

ECONOMIC GROWTH IN RELATION TO DEFENCE EXPENDITURE,
EXTERNAL DEBT AND FOREIGN AID
(A CASE STUDY OF PAKISTAN)

Through this study it has been tried to address the aspects affecting Pakistan's economic growth with particular reference to External Debt, Defence Expenditure, foreign aid and development; moreover an effort will be made to find the relationship between the variables and set the stage for future research in order to address the questions/ queries raised while providing Foreign Aid/ grants and loans to Pakistan. Specific objectives are as follows:-

8. To understand and investigate the relationship between Defence Expenditure, Economic Growth, External Debt, Foreign Aid and Development.
9. To assess the intensity and degree of impact these variables have upon each other.

2. Defence Expenditure and Economy

2.1   Defence is the basic right of every country so is the international trade, therefore, no country can be absolved of the basic obligations of any of the two. Defence expenditure is a budgetary obligation that needs to be financed by the Governments, if state of funds for Government revenue/ receipts (in terms of taxes) is not healthy enough to meet demands of defence expenditure, a budget deficit is likely to occur. In this situation the exports of a country usually, are limited, it will be forced to borrow from external resources, contributing to accumulation of external debt (J. Paul Dunne, 2004)[10]. However if a country is capable of boosting exports through indigenous production of arms, even then it would require foreign exchange to set up such industry for establishing high-tech gadgetry/ machinery (Gunluck Senesen, 2004)[11].

2.2   As a matter of principle defence expenditure does have a positive or negative effect on economic growth and external debt. It's a fact that defence expenditure reduces the availability of public funds available for development of civilian sector. Deger[12] (Deger, 1986) suggested that defence expenditure consumes resources earmarked for productive sectors and retards the process of savings. Studies have also concluded that defence expenditure retards economic growth Dunne et al [13](Dune, 2002). Abu-Bader and Abu-Qarn (2003)[14] found that non defence expenditure caused positive economic growth in Israel and Syria, on the other hand negative effect was found between defence expense and economic growth in Egypt, Israel and Syria.

2.3   Dunne et al (Dunne, 2004, p. 182)[15] suggests that while developing a model of defence expenditure and external debt, the focus shall not be on the evolution of debt, but to determine the impact of defence expenditure on debt. Brzoska suggests that expenditure on arms was responsible for 20% to 30% of external debt in developing countries during

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[10] Military Expenditure and Economic Growth in small Industrialised Economies, Taylor and Francis Journals, 2004.

[11] The Role of Defence on External Indebtedness : An Assessment of Turkey, Defence and Peace Economics, 15 (2), 151-156.

[12] Economic development and defense expenditures, Economic Development and Cultural Change, Deger, 35: 179-196, 1986.

[13] Trade in Developing Countries, edited by Jurgen Brauer, J. Paul Dunne (London: Palgrave Publishing), 319–325 (2002).

[14] "Government expenditures, military spending and economic growth: causality evidence from Egypt, Israel, and Syria," Journal of Policy Modeling, Elsevier, vol. 25(6-7), pages 567-583, September.

[15] Military expenditure and debt in South America, Dunne et al , Journal of Defence and Peace Economics, 2004.

1979 (Brzoska, 1983)[16]. Further it (Looney, 1986) categorized developing countries according to resources into *resource constrained* and *unconstrained* countries. Unconstrained countries were able to support a higher level of arms imports and found that arms imports had positive impact on external debt of the sample countries (Narayan, 2009)[17].

2.4 Looney (E.Looney, 1998)[18] indicated that higher defence expenditures affected the capability of external borrowing in Pakistan, and Pakistan had a higher percentage of Military Expenditure to GDP (Dunne, 2004)[15]. Looney also managed to find a strong correlation between the defence expenditure of Pakistan to the External debt. His findings suggest that the pattern has been shifting over time, from 1958-73 the gap between external debt and non-defence expenditure expanded as compared to period from 1973-89, where the relationship has been weak positive between defence expenditure and external debt. The results conclude that Military expenditure vis budgetary allocations were strongly affected by Pakistan's foreign debt, the accumulation of debt over a period of time either resulted in the lenders' concerns over future repayments or the Governments itself for planning to meet the shortfalls through revenue generation (Looney, 1995)[19]. David Cronin commented that, out of US$ 11 Billion provided to Pakistan between 2002 and 2008, US$ 8 billion were used for military assistance and only 100 million dollars were allocated to education in Pakistan (Cronin, 2008)[20].

2.5   In USA, the federal Budget has remained in deficit since 2001, on the contrary the spending on military for funding war in Afghanistan and Iraq has cost almost $ 1.1 trillion in direct costs (Edwards, 2010)[21]. Whereas the indebtedness increased by $1.3 trillion, after US started funding the war the Debt- GDP ratio rose by 9-10 percentage points in USA, and if the forecasts of defence expenditures prove to be correct i.e. US $ 2.8 trillion by year 2020 in direct costs and an additional US$1.7 trillion as indirect costs, the grand total of debt in US would be US$ 3.8 to US$ 4.5 trillion in addition and rise in debt to GDP ratio may touch 20 percentage points. The Defence expenses financed despite budgetary may raise indebtedness further and exert an additional pull on GDP. Ryan (Edwards, 2010) made a counterfactual scenario and calculated the interest rate based on the debt to GDP ratio for US, findings indicated that Debt to GDP could decline if military operations in Afghanistan and Iraq are not considered; contrarily it could rise if it was to be calculated putting the effect of war spending into it.

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[16] Brzoska, M. (1983). The Military Related External Debt of Third World Countries. Journal of Peace Research, 3 (20), 271-277.

[17] A Panel Data Analysis of the Military Expenditure-External Debt Nexus: Evidence from Six Middle Eastern Countries, Russell Smyth, Paresh Kumar Narayan, Journal of Peace Research, 1 March 2009.

[18] E.Looney, R. (1998). Foreign Capital Flows and Defense Expenditures: Patterns of Causation and Constraint in Pakistan. Canadian Journal of Development Studies, 19 (1), 117-127.

[19] Looney, R. E. (1995). Pakistan, Defence Expenditure and External Debt : Pattern of Causation and Constraint. International Review of Economics and Business, Volume XLII (N.7-8), 619-634.

[20] Most of US aid to Pakistan goes in military spending, David Cronin, One World South Asia, http://southasia.oneworld.net/archive/Article/most-of-the-us-aid-to-pakistan-goes-in-military-spending#.WfYFB1uCzZ4, Jun 19, 2008, accessed on 23 October 2017.

[21] State-building in Afghanistan: a case showing the limits?, Lucy Morgan Edwards, International Review of the Red Cross, December 2010, https://www.icrc.org/eng/assets/files/review/2010/irrc-880-morgan-edwards.pdf, accessed on 23 October 2017.
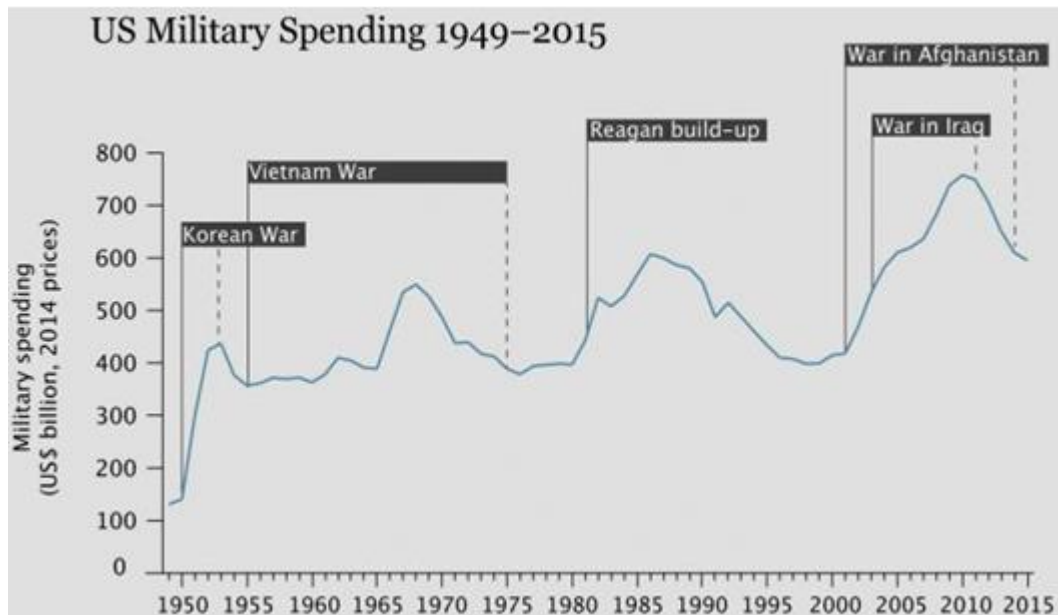
Figure 1, US Military Spending 1949-2015, Source SIPRI, https://www.sipri.org/news/2016/sipri-launches-extended-military-expenditure-data, accessed 23 October 2017

ECONOMIC GROWTH IN RELATION TO DEFENCE EXPENDITURE, EXTERNAL DEBT AND FOREIGN AID
(A CASE STUDY OF PAKISTAN)

Figure 1, US Military Spending 1949-2015, Source SIPRI, https://www.sipri.org/news/2016/sipri-launches-extended-military-expenditure-data, accessed 23 October 2017

3. Defence spending and Economic Growth

3.1   Ancient political systems were based on the coercive powers / empires that raised their armies, military people were highly paid and even conscription was ordered in some cases (Angrist, 1998). Need of one was being fulfilled by the other and vice versa, military expenditure triggered the need for finances and financial hubs required military support, therefore both augmented each other exploiting the need / weakness of the other and cementing own strength (Lorusso, 2011)[22]. Here, the base of linkage between military establishment and public enterprises was found (Seiglie, 1997)[23], however few scholars found that military related expenditures were not always driven by internal or external factors, only a small fraction of the defence expenditures was to be accounted for, through external threats whereas major portion of the economy were driven by other factors.

3.2   Jeffrey & Edwards found that global military expenditures have declined in the 1990s, same way total strength of the Armed Forces in the world dropped from 28.3 million to 22.3 million, but increased in the late 1990s. The defence expenditure has been

[22] Lorusso, M. (2011). Keynesian and New-Keynesian Models :The Impact of Military Sending on the United States Economy. University of Verona, Department of Economics. Verona: Viale dell'Universita.

[23] Seiglie, C. a. (1997). Exploring Potential Arms Race. Economics and Politics, 8 (3), 231-240.

W.Isard, C. A. (1988). Arms Races, Arms Control and Conflict Analysis. Cambridge, U.K: Cambridge University Press.

the single most factor in the most developing countries and behind most of the government bureaucracies (Kick, 2008)[24].

3.3 Establishment of Military industrial complexes (MICs) for local production of military hardware generate business activity across the board at a larger scale. Job opportunities for skilled and unskilledlabour, usage of raw material, infrastructure upbringing, schools, colleges, hospitals, transport industry etc., are the effects of a MICs. Benoit suggests that armies require national infrastructures to move on and sustain (Benoit, 1973)[25]. US Sales from Defence Industry in 2015 was US$ 785.7 Billion i.e. approx 14% of GDP and more than complete Budget of many under developed countries. Likewise Canadian Defence industry consists of more than 800 firms and generated US $ 6.7 Billion in 2016. In Pakistan, the semi military organizations like National Logistics cell and Frontier Works Organizations have done considerable contributions e.g. construction of Karakoram Highway (the highest paved international road constructed between Pakistan and China with a length of over 1300 Km) and providing the largest supply chain network in Pakistan. Li (Li, 1997), mentioned significant contributions of PLA in China for developing road network, bridges besides training over one million people in the Xingjian region. While analyzing the impact of defence expenditure on economic growth i9n Pakistan Saad Khalid[26] commented that Pakistan's Military has an extended role in Country's economy, Fauji group, self-reliant group of companies, run by Army Generals has a variety of projects including fertilizer, food, real estate with world class living facilities and a commercial bank. As per an estimate Military's contribution to the National Exchequer was Rs 158.439 Billion (US $ 1.6 Billion) in 2013[27].

4. Discussion on Models relating to the military expenditure

4.1 Anderton and Isard model[28] (Isard, 1988 termed as the "Submissiveness Model - Organizational Politics Models") focused Economic growth through a budgetary process that was hostage to interests of different groups i.e. politicians, bureaucrats, pressure groups and military hardware industry. Every segment of society has individual objectives and resultantly give a surge to Military expenditure or Defence Budgets. Anderton and Isard have concluded that Organizational Politics Models are having significant impact in short run i.e. for one or two years of military expenditure, whereas these short run spells combine to have a cumulative effect for long run. Thus, the short run spells cannot be ignored.

4.2 Lucier (Lucier, 1979)[29] came out with one of the simplest Organizational Models, in which he established a linkage between past expenditure levels of Defence spending to future patterns of expenditure. He derived an equation as ($M_t=qM_t$-1). In the equation M_t is

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[24] Kick, J. K. (2008). Bringing the Military Back In: Military Expenditures and Economic Growth 1990 to 2003. Journal of World-Systems Research, XIV (2), 142-172.

[25] Benoit, E. (1973). Defence and Economic Growth in Developing Countries. Lexington: Lexington Books.

[26] Saad Khalid, A statistical look into Pakistan's foreign friendships, LSE's engagement with South Asia, http://blogs.lse.ac.uk/southasia/2015/05/05/a-statistical-look-into-pakistans-foreign-friendships, accessed on 24 October 2017.

[27] Pakistan Army's Contribution to the National Exchequer, ForPakistan.org, http://forpakistan.org/pakistan-armys-contribution-to-the-national-exchequer, accessed on 24 October 2017.

[28] W.Isard, C. A. (1988). Arms Races, Arms Control and Conflict Analysis. Cambridge, U.K: Cambridge University Press.

[29] Seiglie Lucier, C. (1979). Changes in the Values of Arms Race Parameters. Journal of conflict Resolution, 1 (23), 17-39

the Military Expenditure at a time t, Parameter referring to the policy making rule is denoted by q. In this model, the value of parameter q is expected to change in the following year with a change in the operating procedures of armament policy. Secondly, value of parameter q is expected to change in the face of circumstances leading to major policy shift, it could be replacement of the policy maker or some international or domestic event having implications for armament policy.

4.3   In an American model by Majeski (Majeski, 1983)[30] discussed four different groups involved in policy making which have influence in deciding upon the level of military expenditure. All the groups mentioned below are having stakes and closely interact with each other to influence the level of military expenditures. These interests groups in U.S. are:-

4.3.1.   US President (Creates a balance between National development and defence budgets).

4.3.2. The US Congress (Will have to focus on the federal and defence budgets).

4.3.3.   Department of Defence (These are involved in appropriations and supplementary appropriations).

4.3.4.   Military and Defence Services (Forward request for demands of Defence Budget).

4.4   Nigel Wilkins (Wilkins, 2004)[31] has discussed Military Keynesianism taking defence expenditure as a tool of fiscal policy and this tool can be used as a catalyst to increase or decrease the demand provided the environment within and outside the borders of that country allow it to do so. As per this school of thought fiscal policy can be steered in either direction upon will and military hardware producing capacity of that country, thereby having a significant impact on the macro economy, but it assumes that there is no corresponding support to augment economy with the help of increased taxation. Critics of Keynesian school argue that in the present security and tense international environment the use of military expenditure as a tool of fiscal policy will only worsen the situation and in the longer run have negative impact on the macroeconomic factors. On the other side Alesina (A.Alesina, 2008)[32] explained the economic aspect of the military expenditure that safety in a country to be considered a public good. Since safety is a by-product of military expenditure, therefore it develops a direct linkage with the economies of scale and production of goods.

4.5   Frederiksen (Peter C.Frederiksen, 1994)[33] has analyzed Pakistan's defence expenditures during a period from 1973 to 1986 and calculated short-run as well as long run adjustment/ impact to measure the changes in the defence burden, and government debt, which affected budgetary allocations to social welfare programs. The study examined that in the short run, most infrastructure programs increased as the military burden reduced. For social welfare programs e.g. housing, infrastructure development and social security

[30] Majeski, S. (1983). Mathematical Models of U.S. Military Expenditure Decision-Making Processes. American Journal of Political Science (27), 485-514.

[31] Wilkins, N. (2004, February). Defence Expenditure and Economic Growth: Evidence from a panel of 85 countries. Defence Expenditure and Economic Growth: Evidence from a panel of 85 countries . Sydney, Australia: Broadway.

[32] A.Alesina, E. R. (2008). Trade, Growth and Size of countries. Amsterdam, Holland.Accounts, I.-S. W. (1993). System of National Accounts 1993. IMF, World Bank, UN, Commission of the European Communities-Eurostat. Brussels/ Lux, New York, Paris, Washington, D.C.: Jointly Published by IMF, World Bank, UN, Commission of the European Communities-Eurostat.

[33] Peter C.Frederiksen, R. E. (1994). Budgetary Consequence of Defence Expenditures in Pakistan: Short Run Impacts and Long Run Adjustments. Journal of Peace Research, 31 (1), 11-18.

the changes in the defence budget appeared to have only a temporary effect on the share out of government expenditure earmarked for infrastructure. Whereas the long-run model suggests that social, welfare programs have as high a priority as economic services. They also found that as the military burden increased, the governments were forthcoming to take out/ spare some resources out of infrastructure programs and intentionally had let the deficit rise for financing social welfare programs.

5.   Determinants of Economic Growth

5.1   Robert Barro (Barro, 1996)[34] carried out a study through a cross-country analysis of 100 countries during 1960–1990 and developed a linkage between democracy, real per capita GDP growth, government consumption, law and order situation and government trade policies with the economic growth. The study developed a framework based on the equation $D_y = f(y, y^*)$, (Barro, 1996, pp. 9-11). In this equation D_y is the growth rate of per capita output, y is the current level of output and y^* is the long run or steady level of per capita output. Barro used the government spending encompassing expenditure for military as well. He found that real per capita GDP is enhanced if law and order situation is better. Government policies are likely to be important for growth. The study found that at the lower level of democracy the economic growth is stimulated, however as the democracy is consolidated and further expands economic growth tends to go down he states "once a moderate amount of democracy has been attained, a further expansion reduces growth. A possible interpretation is that, in extreme dictatorships, an increase in political rights tends to raise growth because the limitation on governmental authority is critical. However, in places that have already achieved some political rights, further democratization may retard growth because of the heightened concern with social programs and income redistribution". (Barro, 1996, pp. 2-3).

5.2   Authoritarian regimes have been instrumental in boosting economic growth, particularly with reference to the region of South Asia. The Ex-Prime Minister of Singapore Mr. Lee Kuan Yew who laid the foundation of Modern Singapore proved this fact. Lee evolved a concept of economic progress through authoritarian government (Autocracy) with particular reference to South East Asia; his thesis came to be known as "Lee Thesis". Mr. Lee not only presented the concept, but also proved the concept practically through implementing the economic policies in Singapore. His basic argument was that autocracies are free from the external pressures therefore there can be focused decision making at national level eventually translating into the economic progress. (Elgin, Asian Values, 2010)[35] A Survey conducted by DYNREG (Dynamic Regions in Knowledge – Driven Global Economy) by EU's sixth Framework-Program for Research and Technology in 2007 for 20 countries examined that (Petrakos, Arvintidis, & Sotiris, 2007, pp. 12-13)[36] the factor which top ranked for restraining economic dynamism was unstable political environment along with insecure formal institutions (Legal system, property rights, tax systems, finance systems) and high level of public bureaucracy closely following behind for the China, on the contrary factors that were found to be most relevant

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[34] Determinants of Economic Growth: A Cross-Country Empirical Study, Robert J. Barro, 1998. " MIT Press Books, The MIT Press, edition 1, volume 1, number 0262522543, April.

[35] Elgin, M. (2010). Asian Values - A new Model for Development? Stanford Journal of East Asian Affairs, 10 (2).

[36] Petrakos, G., Arvintidis, P., & Sotiris, P. (2007). Determinants of Economic Growth: The Experts' View. The Economic and Social Research Institute. The Economic and Social Research Institute.

to economic growth were: (Petrakos, Arvintidis, & Sotiris, 2007, pp. 15-18). Same study, drew a table of comparison between developed and developing countries for degree of influence of specific factors on economic dynamism. Stable political environment was rated the top most factor (out of total 10 factors) for developing countries, whereas the same was ranked 8th for the developed countries. (Petrakos et al, 2007, p. 23).

5.3   Dr Monno Kamal (Monno, 2016)[37] talked about various myths regarding Pakistan's defence expenditure and created a linkage between percentage of defence expenditure to GDP by evaluating security needs. The study mentioned few factors affecting defence budget to include the availability of economic resources. The study finds that Pakistan's defence spending had on the decline in real terms; when viewed in relation to additional responsibilities it identifies that economic managers don't have fiscal flexibility to play with, Pakistan's current security needs vis curtailing defence budget.

5.4   Two gap and three gap models have been discussed in a research paper published by two authors of Pakistan Institute of developmental Economics (PIDE) during 1998 (Zafar Iqbal, 1998)[38]. Discussion takes a lead from an earlier research which concluded that real output growth had infact declined after obtaining external debt because the trade exports had decreased in real term using a two gap model, on the contrary when he used three gap model showed an accelerated growth rate of real GDP. He analysed the data from 1949-1997 using two separate behavioural functions of growth rates for per capita income and real GDP. The variables taken by the authors were Human Capital. (Positively related to real GDP Growth), Physical Capital (Positively related to real GDP Growth), Budget Deficit. (Negatively related to real GDP Growth), Foreign Trade. (Positively related to real GDP Growth), Foreign Debt. (Negatively related to real GDP Growth).

6.   Theories related to Military Spending – Economic Growth
6.1. Keynesianism and Military Keynesianism Debate
6.1.1.   Keynes (Keynes, The General Theory of Employment, Interest and Money, 1935)[39] brought a revolution in the field of economics by writing a book named "The General Theory of Employment, Interest and Money" in 1935. Keynes argued that the aggregate demand is usually affected by decision making at public and private sectors, negating the basic concept of pushing the prices upwards on the supply curve with reduction demand and reduction in wages, he argued that prices and wages are "Sticky" in nature and not likely to change with change in aggregate demand as people would resist the wages cuts and increased prices in times of great depression/ economic recession. Public decisions represent government departments and agencies, whereas private decisions are taken by private businesses in the economic marketplace. Furthermore, contrary to the classical economic theory, Keynes argued that government spending could act as a catalyst for pushing the economic growth upwards because he believed that government spending, private investments and consumer spending (Keynes, The

[37] Defence Budget: The Myth of 70%, Dr Monno Kamal, June 2016, Hilal Magazine
"http://hilal.gov.pk/index.php/layouts/item/2126-defence-budget-the-myth-of-70" accessed on 23 October 2017.
[38] Zafar Iqbal, G. M. (1998). Macroeconomic Determinants of Economic Growth in Pakistan. The Pakistan Development Review, 2 (37), 125-148.
[39] Keynes, J. M. (1935). The General Theory of Employment, Interest and Money (1st ed.). Macmillan Cambridge University Press

ECONOMIC GROWTH IN RELATION TO DEFENCE EXPENDITURE,
EXTERNAL DEBT AND FOREIGN AID
(A CASE STUDY OF PAKISTAN)

General Theory of Employment, Interest and Money, 1935, pp. 20-29) are determinants of the economy. Keynes propagation of public expenditure/ government spending gave rise to another concept called "Military Keynesianism"

6.1.2. Keynes wrote an open letter to US President in 1933 (Keynes, An Open Letter to President Roosevelt, 1933)[40]. Keynes asked the President to put more men to work and increase national income and rely on the expenditure through borrowed or printed money. He mentioned that national purchasing power be increased through loans and not by taxing people, he emphasised that in the past war was regarded as the only legitimate excuse for creating employment, he infact instigated US president to indulge in war to boost economy (Keynes, An Open Letter to President Roosevelt, 1933, p. 8). This letter gave rise to a new term "The Military Keynesianism", he is also criticized to have instigated US President to adopt strategy of war to boost industrial activity.

6.1.3. Hick argued about taking Government spending as an important indicator of defence expense (Hicks, 1937)[41] and divided it into two groups i.e. military budgets and civil department budgets. This distribution stems from Military Keynesianism, Martin Feldstein (Feldstein, 2008) argued that defence Budgets can be misleading if taken as proxy for the government expenditure and not actually depict the government spending, he found that US Government miscalculated and under estimated the declining consumer demand and adopted the Keynesian approach to increase military spending to give an impetus to consumer demand.

6.1.4. Dunne (Dunne, 2011)[42] carried out a study on military expenditure and its effects on the economy and identified three approaches for carrying out econometric analysis, first was through Granger Causality method that simplified the procedure by taking only two variables and finding out bipartite relations between economic growth and defence spending. This was estimated through Johansen method to find out the long run relationship for US data from 1950-2009 and concluded that changes in GDP and defence expenditure had significant effects on Defence expenditure but not on GDP, therefore it did not produce the desired outcome i.e. clearly identifying the relationship between changes in different variables, which necessitated the analysis to focus on the a more structured model than Granger causality.

7. DSGE Model estimated with Beysian technique.

Marco Lorusso (Lorusso, 2011, pp. 28-30)[22] carried out a study on the US economy and found that US economy had different responses to the changes in military and non-military expenditures where non-military expenditures were having comparatively more

[40] Keynes, J. M. (1933, December 16). Open Letter to President Roosevelt. Retrieved October 23, 2017, from New Deal Network: http://newdeal.feri.org/misc/keynes2.htm
[41] Hicks, J. R. (1937). Mr Keynes and the "Classic"; A Suggested Interpretation. Econometrica, 5 (2), 147-159.
[42] Dunne, J. P. (2011). Military Keynesianism: An Assessment. *Second International Conference on Conflict Management, Peace, Economics and Peace Sciences* (pp. 8-9). Beijing: http://ideas.repec.org/.

impact than the latter. Study developed a model on the lines of **Dynamic stochastic general equilibrium** modeling i.e. DSGE modeling, being the most suitable macroeconomic forecasting model for evaluating the welfare effects of policy changes. Utility function was divided into two segments i.e. leisure and consumption, main clients of consumption were military and non-military sectors, revenue is raised through taxes and issuance of nominal debt. It suggested that increase in the resources dedicated to non-military sector (Lorusso, 2011, pp. 58-59)[22] positively affected the wage level of people as compared to military sectors, on the interest rate, non-military spending had a higher effect than military sector spending. Specific findings into the research indicated (Lorusso, 2011, p 61)[22] that increase in the total government spending resulted in an increase in the wages, non-military/ military spending. Secondly, he found that defence spending had weaker effects on consumption and wages with respect to non-military spending; therefore, non-military sectors provided greater returns. He concluded that "switching government priorities in favour of supplying civilian goods and services, rather than financing federal defence spending, should create benefits to the economy" (Lorusso, 2011, p. 62). VAR is (Barry, 1998) tool to measure the probability to find out the extent to which a particular asset or measuring unit is likely to drop in a specified period. It usually focuses towards the downside risk within a specific time, and the results can be used for predicting the future performance of some particular variable. In simplistic terms, the VAR measures the potential loss in value of variable being tested over a defined period. He anticipated the effects on the government spending using VAR estimation technique and termed these changes as the "shocks to the government spending". His research focused on the linkages between the forecasts through business activity, rise and fall of defence spending and changes on the political scene in United States.

8.   Conceptualising / Explanation and Measurement of Variables

8.1.   **Economic Growth**.   No Single measure can become proxy for the economic growth in real terms. However generally economic growth can possibly be sustained increase in size of an economy –nation, region, city - together with the ongoing changes in that economy's structure; public health, literacy and demography and distribution of income" (Quah, 2001)[43]. Usually economic growth is measured by calculating the percentage change in the quantity of goods and services produced from a point of time to the other (usually the time bracket is Financial Year to Financial Year) which equals the real GDP Growth rate. However economic growth can also be measured through factors like GNP, purchasing power parity and total factor productivity but the most common factor continuous to be GDP.

8.2.   For economic growth a standard measure of aggregate output is required, therefore GDP (market value of all final goods and services produced in a country), despite its shortcoming (like over adjustment of inflation, not counting household productions, authenticity of data, disregarding the undocumented/ underground economy and changing price indices), is usually standardised and it's data can be available across the globe, thus chances of being accurate are

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[43] Quah, D. (2001). Economic Growth: Measurement. In International Encyclopedia of the Social & Behavioral Sciences (pp. 4093-4098). Elsevier Science Ltd.

more as compared to other variables. Real GDP is the value of the final goods and services produced in a given year when valued at a constant price, whereas Nominal GDP is the value of the final goods and services produced in a given year valued at a price prevailing in the same year.

8.3. **Production Approach (Accounts, 1993, p. 466)[44]** This approach attempts to calculate GDP through the sum of gross value added by products (homogeneous activities) at basic prices plus taxes less subsidies on products. Its calculation is as follows

Total GDP at market price = [Total Output (goods and services) - consumption for generating goods and services = GDP at Market Price] + taxes on products and imports - subsidies on products.

8.4. **Expenditure Approach (Accounts, 1993, p. 466)**.   It is based on the expenditures incurred in a given period by units in the economy. It is sum of the final uses categories at purchasers' prices (imports counted as negative), on the row for total uses. It is calculated as

Total GDP at market price = Consumption Expenditures of households + services rendered by non-profit institutions serving households + collective and personal services (public administration, defence, social security and safety, education and healthcare) rendered by Govt + Gross Capital Formation + inventory changes = Total Expenditure at current market price + Export of goods and services - imports of goods and services.

8.5. **Income Approach (Accounts, 1993, p. 468)**.   This approach hinges upon the sum of income by the units directly involved in producing goods and services. It is calculated as

Total GDP at market prices = Total profit from production units/ companies + Income received from the self-employment + income in form of wages/ social benefits including income tax + taxes on production and imports - Subsidies on production and import.

9.   External Debt

9.1.   An agreed definition of the External Debt is provided in the Grey Book jointly published by the IMF, OECD and BIS (Bank for international Settlements) in 1998, it states that (IMF, 2003)[45]

"Gross external debt is the amount, at any given time, of disbursed and outstanding contractual liabilities of residents of a country to non-residents to repay principal with or without interest or to pay interest, with or without principal".

9.2.   External Debt is not only a charge on the budget, requiring servicing through government revenues, but it also puts pressure on the balance of payments which requires servicing through foreign exchange earnings, drawdown on reserves and additional borrowings. Pakistan's external debt includes all foreign exchange debt contracted by public and private sector as well as all

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[44] A.Alesina, E. R. (2008). Trade, Growth and Size of countries. Amsterdam, Holland. Accounts, I.-S. W. (1993). System of National Accounts 1993. IMF, World Bank, UN, Commission of the European Communities-Eurostat. Brussels/ Lux, New York, Paris, Washington, D.C.: Jointly Published by

[45] Timothy C Irwin, Defining the Government's Debt and Deficit, November 20, 2015, https://www.imf.org/en/Publications/WP/Issues/2016/12/31/Defining-the-Governments-Debt-and-Deficit-43408, accessed on 23 October 2017.

foreign exchange liabilities of the state bank of Pakistan (Zahid, 2012-13)[46]. The external debt has a clear direct and indirect effect on the economic growth, it is taken to seek development and ends up cutting most of the resources for debt retirement thus shifting the spending away from development.

10. Military Expenditure

10.1. According to SIPRI (Stockholm International Peace Research Institute) the military expenditure includes all current and capital expenditure on armed forces, defence ministries, government agencies engaged in defence projects, para-military forces on personnel, research and development, social benefits to military personnel and families, military procurements of equipment, weapons and military vehicles (SPRI, 2016)[47], world bank also refers to the definition of SIPRI for quoting the data for defence expenditure. Data of defence expenditure can be taken from website of World Bank in terms of US $ (being a standard international currency) and SIPRI data base.

10.2. Though data of World Bank can be taken as an internationally acceptable standard, however in case of Pakistan for this study, data of Defence Budget from Primary Source has been explored i.e. National Budgetary allocations as announced by the Government of Pakistan has been taken, which includes the Establishment Expenditure, Maintenance Expenditure, Sustenance Expenditure and Operational Expenditure. Though, it is at variance from the definition as given by SIPRI (SPRI, 2016) because it does not include Establishment and Sustenance Expenditure of defence procurement agencies, however the Maintenance and Sustenance Expenditure is somewhat included in the equipment cost against the equipment being provided to the Defence Forces.

11. <u>Important Conclusions</u>
11.1.   There is a definite relationship between Defence Expenditure and Economic Growth.
11.2.   Pakistan has been one of the biggest recipient of external loan and foreign aid.
11.3.   Pakistan's national budget has been in deficit since 1950 and in order to fill the gap the financing has been acquired through external resources.
11.4.   Despite deficit budgeting, Pakistan has been increasing its Defence Budget at a continuous rate.
11.5.   Pakistan's foreign aid has been mainly focussed on non-military development.
11.6.   With establishment of MICs the local infrastructure and business takes a boost and it contributes towards improvement of the economic outlook of the area.

12. Research Methodology and Research Design
12.1.   **Theoretical Framework**   Theoretical framework has been made with the objective to explain the relationship between defence expenditure, external debt and economic growth of Pakistan. The data is time series data (secondary data) and cover the time span from year 1958 to 2016. The study analysed three

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[46] Zahid, M. U. (2012-13). Economic Survey of Pakistan: Public Debt. Ministry of Finance. Islamabad: Ministry of Finance, Govt of Pakistan.

[47] SIPRI, https://www.sipri.org/databases/milex/definitions, accessed on 23 Oct 2017.

major variables i.e. economic growth, defence expenditure and foreign debt. The data has been collected from World Bank website for standardisation and acceptance at all levels.

12.2. **Research Methodology**. Data has been taken from (open Source) i.e. Website of World Bank and it has been analysed in E-View Software for analysis and statistical correlation. Moreover qualitative analysis has also been carried out as mentioned in literature review, the results have been matched to form an opinion.

12.3. **Hypotheses**. All possible hypotheses have been formulated/ considered for this study, however H.1, being a measurable hypothesis will be tested through data analysis. Moreover all the hypotheses are with particular reference to Pakistan.

    12.3.1. **H.1** There exists a relationship between Defence Expenditure, External Debt and Economic Growth in Pakistan.

    12.3.2. **H.2** Defence Expenditure and External Debt have long/ short term relation with Economic Growth.

    12.3.3. **H.3** Defence Expenditure has long/ short term relation with Economic Growth.

    12.3.4. **H.4** External Debt has long/ short term relation with Economic Growth.

    12.3.5. **H.5** Defence Expenditure has a Direct/ Indirect relation with External Debt.

    12.3.6. **H.6** There is exists a triangular relationship between Defence Expenditure, External Debt and Economic growth.

    12.3.7. **H.7** There exists a relationship between Defence Expenditure, External Debt, Economic Growth and Development Expenditure in Pakistan.

    12.3.8. **H.7** **Null Hypothesis** Defence Expenditure - External Debt and Economic Growth do not have any relationship.

12.4. **Data Description** For qualitative part of the research four variables are being considered. In addition to three variables discussed above a variable of development funds is also considered as proxy for development expenditure (this includes the funds received as foreign aid/ assistance, industrial, agriculture and services value added plus gross capital formation added during each year) variables have been calculated in terms of percentage of the GDP, however to cater for variance in the graphs logs of Defence Expenditure and External Debt have been taken to meet Economic Growth. External debt includes debt owed to non-residents repayable in currency, goods, or services . Publicly or privately guaranteed. As regards Economic growth the real GDP growth data has been taken, whereas defence expenditures have been taken at actual in terms of US $.

13. Trends in logs of Variables

13.1. For standardisation of the data logs of external debt, defence expenditure and economic growth have been taken. There are a number of techniques used in testing the long-term and vibrant relations between external debt, defence expenditure and economic growth. Through this study, we will emphasize and test same relationship between three variables using:-

    13.1.1. Descriptive statistics

    13.1.2. Cointegration tests

13.2.   If the data is stationary, it will be tested through unit root tests. The null hypothesis of a unit root is tested using the Augmented Dickey-Fuller (ADF) Test and Phillips-Perron Test. The ADF test is used for examining the presence of a unit root in an autoregressive model, a basic autoregressive model is $Zt = \alpha Zt\text{-}1 + \mu t$. Since the ADF tests assume that the error terms are statistically independent and have a constant variance.

13.3.   If a time series data is non stationary, then it is put to differencing, if it becomes stationary after differencing, it is said to be integrated of the order one i.e. I (1). If two series are integrated of order one, there may exist a linear combination that is stationary without differencing. If such a linear combination exists then such streams of variables are called co-integrated streams. Cointegration tests are having two broad categories:

13.3.1. Residual - based tests

13.3.2. Maximum likelihood - based tests.

13.4.   Residual-based tests include the Engle-Granger (1987)[48] test while maximum likelihood-based tests include the Johansen-Juselius[49] tests. During the current study, Johansen and Juselius test will be applied to determine the presence of co-integrating vectors in a set of non-stationary time series data. The null hypothesis would be a situation where no cointegration exists among the series.

13.5.   In order to test multivariate cointegration the approach of vector auto-regression (VAR) is employed. This assumes that all the variables in the model are endogenous. The Johansen and Juselius procedure is employed to test for a long-run relationship between the variables. Johansen and Juselius suggest two likelihood ratio tests for the determination of   the number of co-integrated vectors. The maximal eigenvalue test evaluates the null hypothesis that there are at most r co-integrating vectors against the alternative of r + 1 co-integrating vectors. In order to apply the Johansen procedure, lag length is selected on the basis of the Akaike Information Criterion (AIC).

13.6.   If a situation occurs where cointegration is existing in the long run, then the system of equations is usually restructured by inserting an error correction term in order to capture the short-run deviation of variables from their relevant equilibrium values. This is necessary as the impact of financial development is generally more apparent in the short run and disappears in the long run as the economy expands and matures. According to Granger (1988), the presence of cointegrating vectors indicates that Granger causality must exist in at least one direction. A variable Granger causes the other variable if it helps forecast its future values. In cointegrated series, there can be a situation where variables may share common stochastic trends so that dependent variables in the VECM must be Granger-caused by the lagged values of the error correction terms. This is

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[48] Co-Integration and Error Correction: Representation, Estimation, and Testing, Robert F. Engle and C. W. J. Granger, Econometrica, Vol. 55, No. 2 (Mar., 1987), pp. 251-276

[49] The Johansen-Juselius Multivariate Cointegration Technique: Application and Interpretation, EMEKA Nkoro, Aham Kelvin Uko, 2016, http://scholarpublishing.org/index.php/ASSRJ/article/view/1961, accessed 23 Oct 2017.

possible because error correction terms are functions of the lagged values of the level variables. Thus, evidence of cointegration between variables itself provides the basis for the construction of an error correction model (ECM). The ECM permits the introduction of past disequilibrium as explanatory variables in the dynamic behaviour of existing variables and thus facilitates in capturing both the short-run dynamics and long-run relationships between variables. In order to explore chronological Granger causality between the variables joint F-test is applied to the coefficients of each explanatory variable in the VECM.

13.7. The variance decomposition returns hinges upon analysis of responses from variables to the shocks, if a shock is given through the error term, influence of this shock on other variables and time horizon/ percentage of the error variance is examined. The F test is within-sample causality test and it has a limitation that it does not allow to gauge the relative strength of the causality among variables beyond the sample period. To examine out-of-sample causality, variance decomposition analysis is resorted to in order to induce partitions in the variance of the forecast errors in variable to proportions attributable to shocks to each variable in the system. Variance decomposition analysis results gives the change in the value of the variable in a particular period resulting from changes in the same variable.

13.8. To examine a random shock, the technique of impulse response is used for one variable on other variables of interest.

14. Results and Data Analysis

Descriptive Statistics

	Defence Expenditure	External Debt	Economic Growth
Mean	9.612742	10.53623	10.92899
Median	9.560266	10.52345	10.85919
Maximum	9.905539	10.82888	11.37406
Minimum	9.442762	10.22946	10.58515
Std Deviation	0.140585	0.166234	0.253163
Skewness	0.756702	0.203883	0.412182

Correlation between Variables. Means, standard deviations, Median, Skewness and correlations among the study variables are shown in the Table. Correlation analysis was conducted to measure relationship among the variables. Strong positive relationships were found between Defence Expenditure and External Debt (r= 0.90, p < 0.01) and Defence Expenditure and Economic Growth (r= 0.95, p < 0.01). Strong relationships were found between External Debt and Economic Growth (r= 0.95, p < 0.01).

Correlation Matrix

	Defence Expenditure	External Debt	Economic Growth
Defence Expenditure	1		
External Debt	0.903	1	
Economic Growth	0.951	0.958	1

Unit Root Test

ECONOMIC GROWTH IN RELATION TO DEFENCE EXPENDITURE, EXTERNAL DEBT AND FOREIGN AID
(A CASE STUDY OF PAKISTAN)

1. It is extremely important in time series data to examine whether data is stationary or non-stationary. The mean / variance of a non-stationary time series data depends on time, and time will approach infinity. Non-stationary data is the standard OLS regression may lead to incorrect conclusions. If we consider that two completely unrelated series and both non stationary there is a possibility to find either a significant positive relationship or significant negative relation.

2. To cater for this E views has been used to identify whether data is stationary or non-stationary with the help of **Unit Root Test.** As a first step the stationarity of index series is to be checked. For this purpose, the ADF test for unit roots has been used at level and first difference. Table below exhibits the results of the Dickey-Fuller (ADF test), which finds that data is not stationary at level but that the first differences of the logarithmic transformations of the series are stationary. Thus, the series is integrated to the order of one I (1).

Unit Root Analysis

	ADF- Level	ADF- 1st Diff
Ln Defence Expenditure	0.870	-3.4778
Ln External Debt	-2.404	-4.088
Ln GDP	0.808	-4.364
Defence Expenditure at 1% Critic. Value	-3.724	-3.737
Defence Expenditure at 5% Critic. Value	-2.986	-2.991
Defence Expenditure at 10% Critic. Value	-2.632	-2.635

Cointegration Analysis

3. Having met these prerequisites, we can now perform cointegration analysis. The maximum likelihood-based Johansen (1988, 1991) test and Johansen-Juselius (1990) procedure is used to determine the presence of cointegrating equations in a set of non-stationary time series. A trace statistic has been used to test the null hypothesis of r cointegrating vectors against the alternative of r or more cointegrating vectors. Tables below exhibits the results of the multivariate cointegration test for the entire sample period.

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized		**Trace**	**0.05**	
No. of CE(s)	**Eigenvalue**	**Statistic**	**Critical Value**	**Prob.****
None *	0.791016	40.91084	29.79707	0.0018
At most 1	0.190965	4.904401	15.49471	0.8189
At most 2	0.001321	0.030392	3.841466	0.8616
Trace test indicates 1 cointegrating eqn(s) at the 0.05 level				
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized		**Max-Eigen**	**0.05**	
No. of CE(s)	**Eigenvalue**	**Statistic**	**Critical Value**	**Prob.****
None *	0.791016	36.00644	21.13162	0.0002
At most 1	0.190965	4.874009	14.26460	0.7577
At most 2	0.001321	0.030392	3.841466	0.8616
Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level				

4. The trace test indicates the presence of one cointegrating equation at the 0.05 level and maximum eigen value indicates the presence of one cointegration equation at the 0.05 level. Therefore, the result provides evidence of a long-term

relationship between defence expenditure, external debt and GDP. However, it must be noted here that the Johansen cointegration tests do not account for structural breaks in the data.

Vector Auto regression (VAR) Estimates. Ideally VAR approach has been considered as a good characteristic to find short term relationship between the variables. The biggest advantages of VAR model is that estimation is very simple and in the sense that each equation can be estimated with the usual Ordinary Least Square method separately. If results are > 1.96, then short term relationship exists between the variables. We found out that there is no short term relationship between External Debt, Defence Expenditure and Economic Growth.

Vector Error Correction Estimates Table above exhibit, t statistic of vector error correction model is less than 1.96, thereby indicating that no short term disequilibrium exist between variables. It also provides an evidence from ΔDE, ΔED and ΔGDP that no short run relationship exist among all three variables.

Error Correction:	D(GDP)	D(DE)
CointEq1	-0.025051	-0.087538
	(0.18462)	(0.19651)
	[-0.13568]	[-0.44547]
D(GDP(-1))	-0.268349	-0.198077
	(0.35015)	(0.37268)
	[-0.76639]	[-0.53149]
D(GDP(-2))	-0.283698	0.016232
	(0.45593)	(0.48527)
	[-0.62225]	[0.03345]
D(DE(-1))	0.431385	0.510380
	(0.31743)	(0.33786)
	[1.35900]	[1.51064]
D(DE(-2))	0.366916	0.245108
	(0.35617)	(0.37909)
	[1.03018]	[0.64657]
D(ED(-1))	0.314322	0.470657
	(0.32103)	(0.34169)
	[0.97911]	[1.37744]
D(ED(-2))	-0.448768	-0.419109
	(0.34009)	(0.36198)
	[-1.31956]	[-1.15783]
C	0.040753	0.011060
	(0.02335)	(0.02486)
	[1.74504]	[0.44495]

Granger Causality Test. In line with the Granger-Engle representation theorem, if two variables are cointegrated then Granger-causality must exist in at least one direction. The results of Granger causality are reported in Table below. Rejection of the null hypothesis at 5% indicates that there exists unidirectional Granger causality between Economic Growth and External Debt at the 5% level. No other variable unidirectional Granger causality.

Parawise Granger Causality Test

Granger Causality Tests			
Null Hypothesis:	Obs	F-Statistic	Prob.
RDE does not Granger Cause RGDP	23	1.28911	0.2998

ECONOMIC GROWTH IN RELATION TO DEFENCE EXPENDITURE, EXTERNAL DEBT AND FOREIGN AID
## (A CASE STUDY OF PAKISTAN)

RGDP does not Granger Cause RDE		**0.42295**	**0.6615**
RED does not Granger Cause RGDP	**23**	**0.68080**	**0.5188**
RGDP does Granger Cause RED		**6.16080**	**0.0092**
RED does not Granger Cause RDE	**23**	**1.22560**	**0.3169**
RDE does not Granger Cause RED		**2.12326**	**0.1486**

Impulses Response. The impulses response function examines the response of the variables in the VAR to shocks in the error terms. Impulse response explains change in variables will generate the change in other variable. In our scenario the effects of Defence Expenditure and External Debt have been checked on Economic Growth. It has been examined that by introducing one standard deviation shocks to the variable do show some response. The Impulse response functions capture the effect innovations of GDP to Defence Expenditure and GDP to External Debt. These figure confirm that a similarity exists between shocks for upto 2-3 periods, however detailed examination reflects that by a single shock in Defence Expenditure the effects can be seen in initial 2-3 years and thereafter the same trend continues, however in case of external debt the shocks have weaker effect for first 2-3 years and then the effect diminishes. It can be concluded that any change in Defence Expenditure will have initial impact on Economic growth for 2-3 years and then this effect will continue, whereas change in external debt will have weak effect on economic growth for 2-3 years.
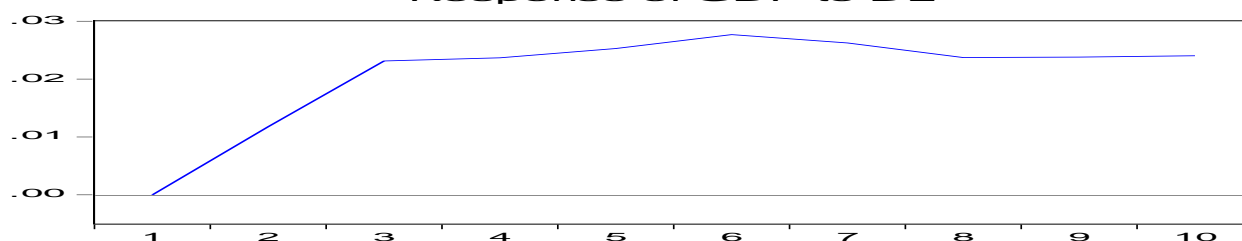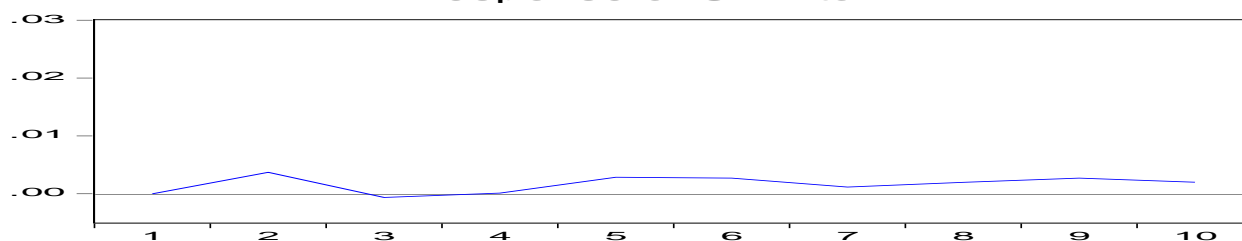
Variance Decomposition. Variance decomposition indicates how much a variable is explained/ effected due to its internal factors. GDP is influenced by 66 % to 100 % by itself, whereas lesser contribution has been examined in other factors i.e. 6 % to 32 % in case of Defence Expenditure and for external Debt this is almost insignificant as shown in Table below. Variance decomposition designates which variables have short-term and long-term influences on another variable of interest.

Variance Decomposition of GDP				
Period	**S.E.**	**GDP**	**DE**	**ED**
1	**0.032874**	**100.0000**	**0.000000**	**0.000000**
2	**0.047427**	**93.22712**	**6.162253**	**0.610626**
3	**0.060043**	**80.92110**	**18.68725**	**0.391655**
4	**0.073243**	**76.74428**	**22.99226**	**0.263456**
5	**0.086196**	**74.50541**	**25.19403**	**0.300568**

6	0.095848	70.97233	28.70511	0.322555
7	0.103757	68.82325	30.88873	0.288022
8	0.111280	68.32589	31.39193	0.282179
9	0.118103	67.76766	31.92872	0.303622
10	0.124030	66.99679	32.70197	0.301241

15. Summary of Results.

In correlation strong positive relationships were found between Defence Expenditure and External Debt **(r= 0.90, p < 0.01)** and Defence Expenditure and Economic Growth (r= 0.95, p < 0.01). Strong positive relationships were found between External Debt and Economic Growth (r= 0.95, p < 0.01). In Unit Root Test the ADF test for unit roots has been used at level and first difference, which clearly show that the time series is not stationary at level but that the first differences of the logarithmic transformations of the series are stationary. Lag length is selected by using Schwartz Barisal criteria and appropriate Lag length is 2. The trace test indicates the presence of One cointegrating equation at the 0.05 level and maximum eigenvalue indicates the presence of One cointegration equation at the 0.05 level. Therefore, the result provides evidence of a long-term relationship between external debt, economic growth and defence expenditure. The study found out that there is no short term relationship between Economic Growth (GDP), External Debt and Defence Expenditure. if two variables are cointegrated, then Granger-causality must exist in at least one direction. The results of Granger causality rejected null hypothesis at 5, which indicated that no Granger causality exists between three variables. The responses of GDP have also been examined by using impulse response analysis in the VAR system and results confirm that a two period similarity exist between the variables.

### 16. Qualitative Analysis based upon Trends

16.1 In order to keep the normality of data and integrate the effect of Foreign Aid with a need to examine the effects of Foreign Aid on development and thwart the criticism of diverting foreign aid to Defence Expenditure instead of development and combined effects of all factors on the economic development. Qualitative analysis has also been carried out to match the results of statistical tests. Assumptions and normality of the data has been carried out for standardisation taken from World Bank data sets.

Proxies used for each variable are as under

Variable	Proxy	Data
Economic Growth	GDP	Log of data GDP Growth Rate in %
Defence Expenditure	Defence Budget	Log of data (% of defence Expenditure to GDP)
Development	FDI and Gross Capital Formation in country	Log of data Yearly data with % of GDP
External Debt	External Debt Stocks	Log of data % of GDP
Foreign Aid	Net official development assistance / aid	% of GDP

16.2 Data has been normalised to fix in the graphs, therefore log of the data has been taken to match the data of foreign aid which was almost insignificant. The results are as follows

ECONOMIC GROWTH IN RELATION TO DEFENCE EXPENDITURE, EXTERNAL DEBT AND FOREIGN AID (A CASE STUDY OF PAKISTAN)
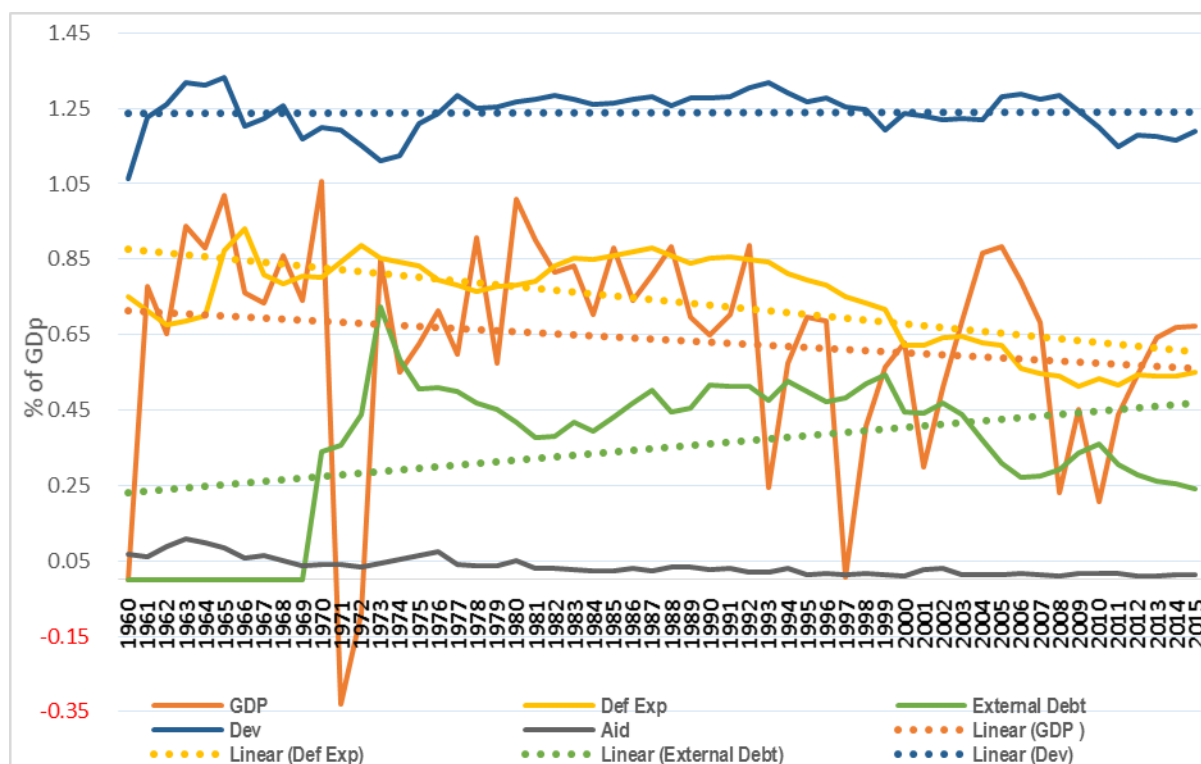

17. Results and Findings

17.1.1 Explanation of the Graph. The data covers a period from 1960 to 2015. An average of Economic growth has been taken to examine the trend in the economy in relation to the other factors. Graph indicates abrupt patterns in the variables with GDP growth in negative during 1997, however the trend lines indicate that there is a linkage between all the variables.

17.1.2 Defence Expenditure has been steady in relation to the GDP, however the trend line indicates that in terms of moving average it is closely following the trend of Economic Growth. Therefore there seems a definite linkage between Defence Expenditure and Economic Growth.

17.1.3 Data of External Debt includes the sum of all external debt owed to non-residents in currency, goods, or services. The debt is on the rise, the trend line indicates an upward trend in the external debt in terms of exponential average. However the slope indicates that it is almost moving in a pattern similar to the economic growth and defence expenditure.

17.1.4 Foreign aid is the sum of net official development assistance consisting of loans and grants by official agencies, multilateral institutions, to promote economic development and welfare. The data has an irregular pattern, however the exponential trend line indicates that it has some linkage to the pattern of development and it also moves in a small band with nearly no change in the pattern similar to the development trend.

17.1.5 Development data is the sum of FDI and Gross Capital formation in country. It's variance from the mean is to the minimum. However it's pattern indicate that it has no linkage with Defence Expenditure, External debt and Economic growth, however it follows the pattern similar to foreign aid indicating some relationship between the two.

ECONOMIC GROWTH IN RELATION TO DEFENCE EXPENDITURE, EXTERNAL DEBT AND FOREIGN AID (A CASE STUDY OF PAKISTAN)

17.2 Economic growth reflects the GDP growth rate over the period from 1960-2015, there has been an irregular pattern with 1971 being in negative i.e. period of war with India in 1971. There have been periods of high growth with drops in the growth unlike other variables, however it can be observed that it has been observed that it has significant but negative relationship with foreign debt in the short and long run. With Defence Expenditure has significant positive relationship in the long run as indicated from the trend lines of defence expenditure and economic growth.

17.3 **Future Trends**. The trend lines indicate that three variables i.e. Defence Expenditure, Economic growth and foreign Debt have significant relationship with each other. However the direction of slope indicates that in the longer run foreign debt has negative but significant relationship with other two variables in the long run. However in year 2030 all three variables will converge at one point if the pattern remains the same, thereafter foreign debt will cross the growth. With regards to Development and foreign aid, both have nearly similar trend on future, however foreign aid/ assistance appears to be negative correlated with development in the future.
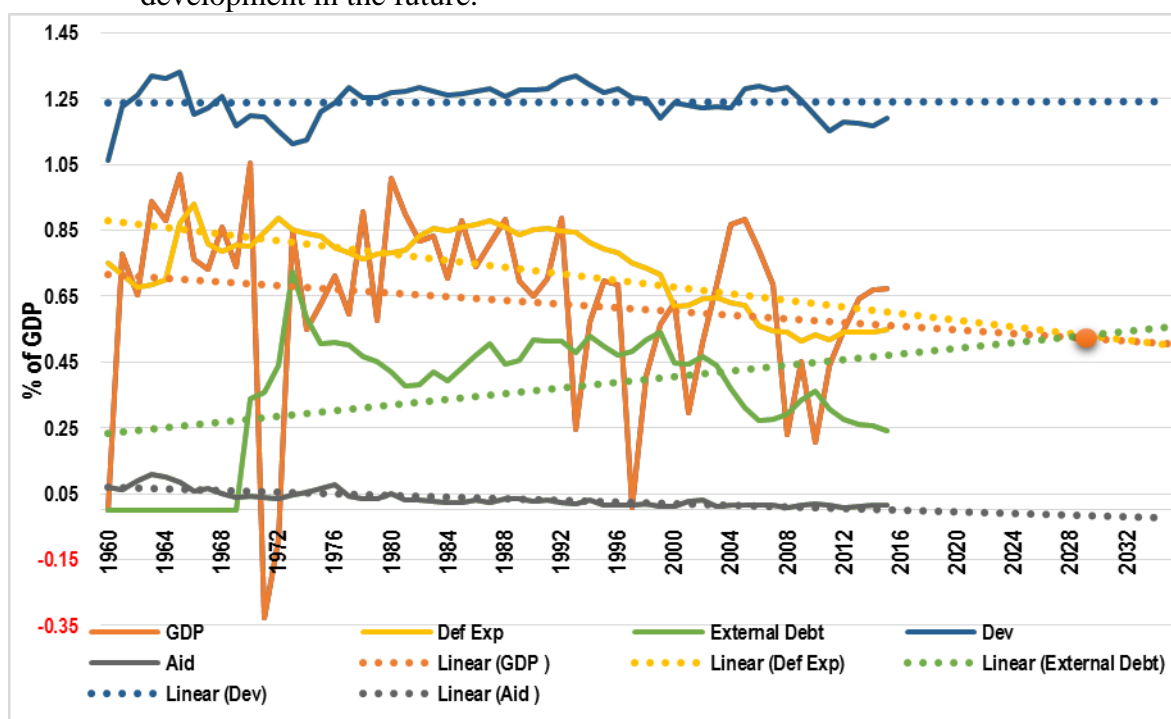
17.4 **Confirmation/ matching the results with empirical analysis**

	• Strong Positive - PP • Positive - P			• Strong Negative - NN • Positive - N			No Relation x		
	Def - GDP	Def – Debt	Def- Aid	Def – Dev	GDP – Dev	GDP- Aid	GDP- Dev	Dev- Aid	Dev - Debt
Empirical Analysis	PP	PP	Not carried out	Not carried out	PP	Not carried out	Not carried out	Not carried out	Not carried out
Trend Analysis	PP	NN	X	X	NN	X	X	P	X

The comparison of results indicates that Defence Expenditure, Foreign Debt and Economic growth are correlated to each other. Moreover Foreign aid and development do not have

significant impact on economic growth, defence expenditure and foreign debt, however these are correlated to each other and it can be assumed that development funds are not diverted to defence expenditure. The results indicate that all variables are correlated in the long run.

18. Conclusions

> 18.1   This paper examined the empirical as well trend analysis between variables. Empirical analysis was carried out for lead- lag relationship among Defence Expenditure, External Debt and Economic Growth (GDP) for the period from 1960- 2015 by using multivariate cointegration analysis and the Granger causality test. The results provided evidence on relationship among all variables. The result provided evidence of a long-term relationship between all three variables and did not find any short term relationship. Rejection of the null hypothesis at 5% indicates that there exists unidirectional Granger causality at the 5%. While matching the results with trend analysis the existence of long term relationship between all three variables has been confirmed. Two additional variables i.e. Foreign Aid and Development were added in trend analysis and these two proved to be significantly related to each other and no evidence was found for these variables with other three variables. The findings also thwart the criticism of diverting development funds to meet the defence requirements in Pakistan.
>
> 18.2   Existence of long term relationship and prediction for year 2030 provides a significant lead to policy makers to look for effective long term decision making.

19.   Recommendations.

As per results above there exists a long term relationship between defence expenditure, external debt and economic growth and a correlation between foreign aid has been found with development. Following in this regard is recommended:-

> 19.1   Policy making may be objective and adopt international policies e.g Planning, programming, Budgeting and Evaluation systems (PPBES) for future planning and look for at least 10 year plan with clear objective and goals.
>
> 19.2   Policy makers may take into account the importance of year 2030 for economic policy making as suggested by the results of the study.
>
> 19.3   While taking loans from IMF/ World Bank it must be kept in mind that this loan will ultimately effect the financial health after 3 years therefore an element/ planning of debt repayment capacity be kept in mind.
>
> 19.4   Every Budgeting process be planned with debt repayments factor/ funds in mind. Moreover Govt Economic policy makers may consider a Medium – Long tem budgetary framework. This framework is recommended to reflect a financial forecast of next 3-5 years to include debt repayments.

20.   Implications for Pakistan

This study has been able to identify the linkages between and find that it's not always the Defence Expenditure which retards the economic growth in Pakistan, but it's the external debt which has a trickle-down effect on the overall economic health of a country.

ECONOMIC GROWTH IN RELATION TO DEFENCE EXPENDITURE, EXTERNAL DEBT AND FOREIGN AID (A CASE STUDY OF PAKISTAN)

Going by Keynesian model and Lee thesis, Defence production industry may be promoted to significantly contribute towards economic growth.

21. Future Research

20.1. Govt policies play a vital role in establishing a positive or negative impact on defence expenditure vis-à-vis external debt. Thus the focus of future research should be on analysing the role and consistency of Govt policies and possibility of adopting PPBES in Pakistan.

20.2. Foreign Aid and Development may also be added to the model for empirical analysis for finding potent results.

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