Educational Quest: An Int. J. of Education and Applied Social Sciences: Vol. 15, No. 02, pp. 73-79, August 2024
DOI: 10.30954/2230-7311.2.2024.5
Peer Reviewed Journal

Does Defense Expenditure Drive Economic Growth? "An Empirical Study of Bharat"

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Received: 09-05-2024 **Revised:** 28-07-2024 **Accepted:** 06-08-2024

ABSTRACT

Background: There have been limited studies which investigate the dynamic relationship between defence expenditure and economic growth. The purpose of the present paper is to attempt to investigate the linkage between defence expenditure and economic growth in Bharat. **Methodology:** The study is based on annual data spans over the period 1981 to 2019. Standard econometric tools like the Unit root test, Auto-Regressive distributed lag model have been used to analyze the data and to draw inferences. **Findings:** The study finds that defence expenditure and economic growth are interlinked in Bharat. It is pragmatics that defence expenditure affects economic growth positively in the short-run as well in the long run. Moreover, Granger causality outcomes revealed that there is a one-way inter-linked between defence spending and economic activities.

Keywords: Defence Expenditure, Economic Growth, Co-integration, Auto Regressive Distributed Lag Model, Bharat

Bharat's confidence is on the rise, propelled by the growing global recognition after 2014. The NDA government has adopted a pragmatic foreign policy approach, aligning with the traditions of the Arthasastra, and has prioritized foreign policy to a greater extent than his predecessors. According to Kautiliya, there are three types of power that a state can wield: Mantra Shakti (Power of Diplomacy), Prabhav Shakti (Power of Defence and Army), and Utsah Shakti (Power of Valor), which can be loosely translated as soft, hard, and smart power, respectively. While possessing military and economic strength is crucial, success in foreign policy hinges on the strategic use of the right tools based on the situation. This paper focuses specifically on Prabhav Shakti, the Power of Defence and Army.

Government expenditure plays a crucial role in stabilizing the economy and providing essential services to the public. It serves a variety of functions, including ensuring social welfare, promoting economic development, and maintaining public infrastructure. However, in order to provide these basic amenities, the government must make important decisions regarding budgetary allocations. The allocation of the government budget is a complex process that involves balancing developmental and non-developmental expenditures. Developmental expenditures are aimed at improving the overall quality of life and economic prospects of the population. These expenditures include investments in education, healthcare, infrastructure, and other sectors that contribute to long-term economic growth and development. On the other hand, non-developmental expenditures, such as defence spends and debt servicing, are necessary but do not directly

How to cite this article: Dey, B., Das, P.P. and Paul, S.R. (2024). Does Defense Expenditure Drive Economic Growth? "An Empirical Study of Bharat". *Educational Quest: An Int. J. Edu. Appl. Soc. Sci.*, **15**(02): 73-79.

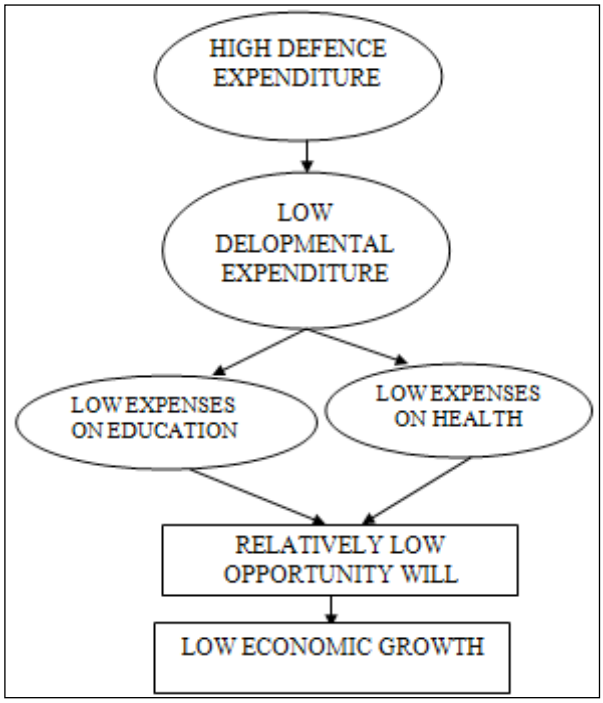
Source of Support: None; **Conflict of Interest:** None

contribute to economic development. Balancing these two types of expenditures is crucial for ensuring that the government can provide essential services while also maintaining fiscal sustainability. The allocation of the budget is typically guided by the government's policy priorities and economic goals. For example, a government may prioritize spending on education and healthcare to improve human capital and productivity. Alternatively, a government facing security threats may allocate more funds to defense spending to ensure national security. Generally, the allocation of government expenditure is a complex process that requires careful consideration of various factors, including economic conditions, social needs, and policy priorities. By effectively managing budgetary allocations, governments can help stabilize the economy and improve the well-being of their citizens. If the developmental expenditure is increased at the cost of non-development expenditure such as defence expenditure this will deteriorate the security of the nation on the other hand, if the non-development expenditure is increased at the cost of development expenditure such as social and economic expenditure this will deteriorate the Economic growth. Therefore, it's always been a nexus for the centre authority of the country to devote the resources towards strengthening the infrastructure of the economy or to stabilize the security of the nation. The defence expenditure and economic growth relationship have been empirically investigated by numerous studies (Stroup and Heckelman, 2001; Cuaresma and Reitschuler, 2003; Aizenman and Glick, 2006; Dunn and Perlo-Freeman, 2003). There has been no recent study is presented in Bharat to investigate the relationships between defence spending on economic growth. Hence, the present study proposing to analyze the trend of defence expenditure in Bharat and also to examine the association among defence expenditure and economic growth makes an original and innovative attempt. I firmly believe that the present study shall contribute to understand the role of defence expenditure and hence, helps in prescribing a better an effective means in the security as well policy prescription of the country. In this regard, the present study used the data from 1981–2019 and also used rigorous econometric technique and to control for other factors such as external debt.

REVIEW OF LITERATURE

The Guns-and-Butter Argument

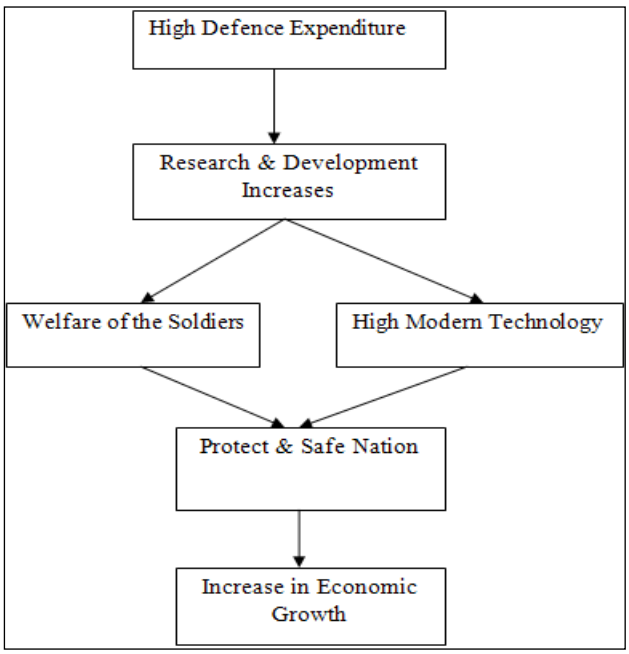
The gun butter argument, which contrasts military spending with domestic social programs, is a metaphor for a conversation or disagreement regarding government spending priorities. It is frequently employed to draw attention to the resource allocation and trade-offs that governments have to consider when determining how to spend the governmental budget. The fundamental tenet of the gun butter defence is that because governments have little financial resources, they must choose how to divide those funds to two major categories: Defence spending on Guns Spending on military and defence-related activities falls under this category. It covers infrastructure for defence, weapons, and finance for the armed services. A powerful military, according to proponents of increased defence spending, is necessary for both deterrence and national security. Spending on social programmes, infrastructure, healthcare, education, and other domestic concerns is represented by the category Butter (Domestic Programmes). Increased domestic spending proponents contend that these gross investments are essential for the population's prosperity and well-being.



Source: *Author's individual Research.*

Fig. 1: Theoretical Framework

Moreover, the Guns-and-Butter Argument postulates that the central administration of the country should make a decision about whether it wants to transfers its money on 'butter' for the improvement of the citizens or 'guns' for providing the safety nets for the civilians such as defence. In other words, the 'guns and butter' argument assumes that defence expenditure and other developmental spending are mutually exclusive. Numerous justifications may be made to shield the Guns or Butter Argument theoretically. From Butter viewpoint, if there is an increase in defence expenditure at the cost of public schemes like better health and skill full education. The low investment on social programs will create an adverse effect on expenditure on socio and economic development, which eventually leads to low capital formation and ultimately the economy may suffer from low economic growth.



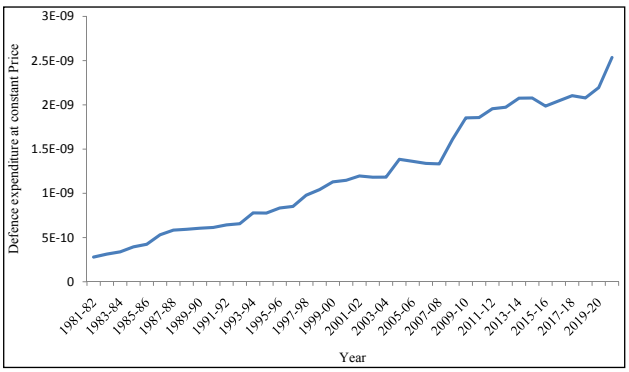
Source: *Author's individual Research.*

Fig. 2: Theoretical structure

Furthermore, increased weight of defence expenditure tends to disproportionately affect the lower-income segments of the population. This is because as defence expenses rise, they can impede the allocation of resources to developmental and social welfare programs. Additionally, in times of economic downturns, when overall employment levels in the country decrease and unemployment rates rise, unskilled labor forces may seek employment in the armed forces. This can have the dual effect of elevating defence spending while also potentially ameliorating economic inequality within the country.

Defence Expenditure in Bharat

It is seen from the figure that Defence expenditure in Bharat is positive though fluctuates over time. From 1981 to 1988 defence expenditure remain more or less stable but mid of 20th due to war in Indo-Pak border, the defence expenditure is increased at a good pace up to 2005, thereafter, the country realizes the threat from its neighboring nations and stress more importance on its defence expenditure, as a result, the expenditure on defence increases at a very significant rate. Moreover, after 2005 defence expenditure remains positive and increased at a sharp rate. Within this time frame, the government also prioritizes various regional defence agreements with other nations and start importing various defence goods such as arms and ammunition which enhance and restructured the security of the country.



Source: *Compiled from Handbook of Statistics on Indian Economy (RBI).*

Fig. 3: Defence Expenditure in Bharat

METHODOLOGY

Causality Test

The study hypothesized that the growth of defence expenditure is influenced by economic growth and growth of economic resources is influenced by growth in military expenditure. In this section, an attempt has been to specify the base structural equation model for investigating the hypotheses concerning the spillover effects of defence expenditure and economic growth and *vice-versa*.

$$EG_t = a_0 + a_1 DEF_t + a^{/} X^{/} + u_t \quad \ldots(1)$$

$$DEF_t = b_0 + b_1 EG_t + b^{/} Z^{/} + v_t \quad \ldots(2)$$

Where EG is the Economic growth and DEF is the defence expenditure of Bharat is a set of control variables which may influence economic growth, and is a set of those control variables which may supposed to influence defence expenditure.

Data

The study used annual data spans over the period 1981 to 2019. The estimation begins from1981 due to insufficient data before 80s. The defence expenditure data is compiled from Stockholm International Peace Research Institute (SIPRI) while economic growth is compiled from the Handbook of Statistics on Indian economy (various issues).

RESULTS AND DISCUSSION

Time-Series properties

The first step of the analysis is to investigate the time-series properties of the variables. If the data under analysis are non-stationary, the result of regression analysis obtained by traditional manner would not reliable. For this purpose, we use ADF-GLS estimators to check the stationary process of the data series. The outcome of the test is reported in Table 1.

Table 1: The ADF GLS test results

Variables	Level	First difference
Defence expenditure	-1.27	-5.82***
Economic Growth	-1.75	-5.67***
External Debt	-1.22	-3.94***

Notes: ****, * Rejection of the null hypothesis of unit root at least at 1 and 10 percent level. Optimal lag length (not shown) is determined by AIC.*

Results of the unit root tests in levels indicate that the computed t-statistics are less than the critical values at any conventional significance level for three variables, thus we do not reject the null hypotheses that variables has a unit root in levels. However, once the first differences of those variables are considered, the null hypothesis of unit root can be rejected. Thus, we have clear evidence that the variables under consideration are stationary but at first difference.

Testing for co-integration

Since the variables are integrated in different orders, we have used OLS-based autoregressive distributed lag (ARDL) approach to co-integration. The ARDL framework for Equations (1) and (2) are expressed as:

$$\Delta LnEG_t = \beta_0 + \sum_{i=1}^{p} \beta_1 \Delta LnEG_{t-i} + \sum_{i=0}^{p} \beta_2 \Delta LnDE_{t-i} + \pi_1 LnEG_{t-1} + \pi_2 LnDE_{t-1} + \gamma_1 LnED + \mu_t \quad \ldots(3)$$

$$\Delta LnDE_t = \beta_0 + \sum_{i=1}^{p} \beta_1 \Delta LnDE_{t-i} + \sum_{i=0}^{p} \beta_2 \Delta LnEG_{t-i} + \pi_1 LnEG_{t-1} + \pi_2 LnDE_{t-1} + \mu_t \quad \ldots(4)$$

Given these equations, to examine the presence of a long-run relationship between defence expenditure and economic growth, we use F-test on the joint null hypothesis that the coefficients of the level variables are jointly equal to 0 (see, Pesaran et al., 2001). Next, we estimate Equations (1) following the ARDL co-integration technique for the long-run estimates. We estimated the model keeping the different criteria, like R^2 criterion, Hannan Quinn Criterion, AIC Criterion and SBC Criterion, in mind to find the coefficient of the level of variables. The long-run and short-run results of all models were almost near identical. Therefore, we present only the results of the model that were selected based on AIC criterion as Monte Carlo experiment of Liew (2004) documented that AIC is superior to other criteria, particularly when time span is less than 60 observations. The calculated F-statistics for the co-integration test are reported in Table 2. The critical values of F-statistics are reported together with calculated F-statistic in the same table.

Table 2: Bounds tests for the existence of a long-run relationship

		5% Critical Values		
Dependent Variable	Calculated F-statistic	I (0)	I(1)	Conclusion
Economic Growth	5.41	4.68	5.15	Co-integration
		1% Critical Values		
Defence Expenditure	6.89	8.74	9.63	No-integration

Note: *A critical value for the EG model is a restricted trend.*

The calculated F-statistic for economic growth model (model 1) is 5.41, which is more than upper bound critical value at one percent level of significance. Thus, the null hypothesis of no

co-integration is rejected in the model, indicating presence of long-run co-integration relationships between the variables. Similarly, the calculated F-statistic for Defence Expenditure model is less than the upper bound value at 1% level of significance. Thus, the null hypothesis of no co-integration is accepted in this case, indicating absence of long–run co-integration relationships between the variables.

The long run coefficients of these models using ARDL approach are estimated in the second step. The results are shown in Table 3.

Table 3: Long Run Coefficients estimating result

Variable	Economic Growth (EG) ARDL (1,5)
Constant	4.45 (3.40)***
Trend	0.10 (9.77)***
Defence Expenditure (DE)	0.42 (5.18)***
External Debt (ED)	0.06 (2.56)***

Notes: *Student's tests are in parentheses. *, **, ***Significant at 10, 5 and 1 percent level, respectively.*

It is evident in the model that the coefficient of Defence Expenditure is positive and statistically significant. This indicates that in the long-run incidence of defence expenditure positively effects economic growth. Defence expenditure can pass the positive impact on economic activities through a number of ways. For instance, Defence expenditure can create employment opportunities, both directly in the defence sector (e.g., military personnel, defense contractors) and indirectly in related industries (e.g., manufacturing, technology, and logistics). This can help reduce unemployment and stimulate economic activity. Secondly, Defense spending often drives innovation and technological advancements, as governments invest in developing new defense technologies. These innovations can have spillover effects, benefiting civilian industries and leading to further economic growth. Thirdly, defence projects, such as the construction of military bases, defense facilities, and infrastructure for defense purposes, can stimulate infrastructure development and investment, boosting economic activity in the region. Lastly, defence spending can have a multiplier effect on the economy, as the income generated from defence contracts and employment can lead to increased consumer spending, further stimulating economic growth. In relation to the control variables, the coefficient of external debt is turned out to be positive and statistically significant indicating a positive association between the level of external debt and economic growth. When external debt is used to finance investments in productive assets, such as infrastructure, technology, and human capital, it can contribute to economic growth. These investments can enhance productivity, stimulate economic activity, and create new job opportunities, ultimately boosting overall economic growth. Secondly, external debt can provide countries with access to capital and resources that are not available domestically. This can be particularly beneficial for developing countries that may lack sufficient domestic savings or investment capital. External borrowing can help these countries fund development projects and initiatives that can spur economic growth.

Estimation of the short-run elasticity: error correction model results

In the final step, we proceed to obtain the error correction representation of equations (3) and (4). Table 4 reports the short-run coefficient estimates obtained from the ECM version of the ARDL models.

Table 4: The Short Run ARDL estimates

Variable	ARDL (1,5)
Constant	4.50 (3.93)***
ΔDE	0.60 [10.12]***
ED	0.06 (4.85)***
ECT_{t-1}	-0.46 (-4.19)***
$\overline{R}^2$	0.44
F	4.71

Notes: *Figures within round bracket ( ) are calculated student's t-statistics; figures within angle bracket [ ] are calculated Wald test statistics. *, **, *** Significant at 10, 5 and 1 percent level, respectively.*

Since the diagnostic tests suggest that obvious nonlinearity and misspecification are absent, and that the residuals show no signs of non-normality or heteroscedasticity, the following inferences can be drawn from the results: We can see that the equilibrium correction coefficients (ECM) assume negative sign and are highly significant in the model. This again confirms the existence of the co-

Table 5

Causality result		
Causality Type	**Conclusion**	**Direction of causation**
Short- run Granger causality		
Short Run Granger causality Change in Defence Expenditure does not affect Economic Growth ($\sum_{i=}^{8} \alpha_2 \Delta\ LnDEV_{t-1} = 0$)	Reject	Positive
Long- run Granger causality		
Long Run Granger causality Change in Defence Expenditure does not affect Economic Growth	Reject	Positive

Source: *Compiled from results of Tables 3 and 4.*

integration relationship among the variables of this model. The values of the estimated ECM coefficient indicate that the deviation from the long-term growth rate in EG is corrected by 46 percent in the next year.

To understand the short-run dynamics, we conducted Wald test on the lagged coefficients of Defence expenditure in the model. Here, null hypothesis which states that lagged coefficients are jointly equal to zero is rejected in the model. Moreover, the short run results are exactly opposite in the signs for DE model as compared to the long run. In the short-run, DE is found to have positive significant impact on EG. These short-run and long-run dynamics between these two variables are presented in a simplified manner in table 5.

Here, we find that the null hypothesis that changes in Defence expenditure do not affect economic growth in the short run has been rejected. This is based on the Table 4 in which it can be seen that F-statistic for the lagged defence expenditure is found significant. The positive sign of the coefficient of economic growth implies that defence expenditure affects economic growth positively in the short-run. The increase in defence expenditure can impact the economy in several ways. Initially, it can contribute to protecting the peace and harmony of the country, which is crucial for fostering a stable environment for investment and employment. This stability can lead to increased economic growth as businesses thrive in a peaceful environment. However, over the long term, the positive impact of increased defence expenditure may diminish. This is because non-development expenditure, such as defence spending, tends to divert resources away from developmental expenditure. Developmental expenditure, which includes investments in infrastructure, education, healthcare, and other sectors, is essential for sustainable economic growth. When a significant portion of the budget is allocated to non-development expenditure like defence, it can limit the funds available for developmental projects. This can have a negative impact on future investments and economic growth, as the development of infrastructure and human capital is crucial for long-term prosperity. Therefore, while defence expenditure can initially have positive effects on the economy, it is important for policymakers to strike a balance between defense spending and developmental expenditure to ensure sustainable economic growth in the long run.. Thus, when developmental expenditure falls in the short-run, the income level also falls in a multiplier way. It can be clearly seen from the table 5 which depicts that the causal link between EG to DE in the long run. Negative co-efficient of EG reflects that DE in the long-run cause falls in economic growth.

SUMMARY AND CONCLUSION

The study employed time-series data to explore the relationship between defence expenditure and economic growth, revealing a consistent interconnection in Bharat. It was observed that defence spending positively influences economic growth both in the short and long term, indicating a sustained positive relationship between the two factors. This finding supports the hypothesis that increasing investment in defence can have a beneficial impact on economic growth in the Bharat context. Furthermore, the study suggests that in the short term, the relationship between defence expenditure and economic growth is particularly

strong. This effect could be attributed to the perception that additional investment in the defense sector enhances national security, subsequently boosting investor confidence and overall economic conditions. Overall, the study's findings underline the importance of defense expenditure as a potential driver of economic growth in Bharat, suggesting that strategic investments in defense can yield positive economic outcomes.

Limitations and Future Study

One limitation could be the availability and quality of data. Military expenditures and economic growth figures may not always be reported accurately or consistently, which could affect the reliability of the findings. Moreover, another limitation could stem from the assumptions made in the ARDL model. While the model may capture complex relationships, it relies on certain assumptions about the functional form of the relationship, which may not always hold true in reality.

A potential future study in this area could focus on the impact of defence expenditure on income inequality in Bharat. This study could use a combination of quantitative analysis and qualitative methods to explore how military spending affects different income groups, potentially contributing to a more nuanced understanding of the social and economic implications of defence expenditure in Bharat.

REFERENCES

Aizenman, J. and Glick, R. 2006. Military expenditure, threats, and growth. *Journal of International Trade & Economic Development*, **15**(2): 129-155.

Amegavi, G.B., Langnel, Z., Ahenkan, A. and Buabeng, T. 2022. The dynamic relationship between economic globalisation, institutional quality, and ecological footprint: Evidence from Ghana. *The Journal of International Trade & Economic Development*, pp. 1-18.

Dunne, J.P. and Perlo-Freeman, S. 2003. The demand for military spending in developing countries: A dynamic panel analysis. *Defence and Peace Economics*, **14**(6): 461-474.

Hussain, F., Hussain, S. and Erum, N. 2015. Are defense expenditures pro poor or anti poor in Pakistan? An empirical investigation. *The Pakistan Development Review*, pp. 875-892.

Harris, G. 1986. The determinants of defence expenditure in the ASEAN region. *Journal of Peace Research*, **23**(1): 41-49.

Liew, V.K.S. 2004. Which lag length selection criteria should we employ?. *Economics Bulletin*, **3**(33): 1-9.

Nworji, I.D., Okwu, A.T., Obiwuru, T.C. and Nworji, L.O. 2012. Effects of public expenditure on economic growth in Nigeria: A disaggregated time series analysis. *International Journal of Management Sciences and Business Research*, **1**(7): 1-15.

Pesaran, M.H., Shin, Y. and Smith, R.J. 2001. Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics*, **16**(3): 289-326.

Stroup, M.D. and Heckelman, J.C. 2001. Size of the military sector and economic growth: A panel data analysis of Africa and Latin America. *Journal of Applied Economics*, **4**(2): 329-360.

Stockholm International Peace Research Institute. 2007. *SIPRI Yearbook 2007: Armaments, Disarmament, and International Security*. SIPRI Yearbook.

Roux, A. 1996. Defence expenditure and economic growth in South Africa. *Studies in Economics and Econometrics*, **20**(1): 19-34.

Ram, R. 1995. Defense expenditure and economic growth. *Handbook of Defense Economics*, **1**: 251-274.

Su, C., Xu, Y., Chang, H.L., Lobont, O.R. and Liu, Z. 2020. Dynamic causalities between defense expenditure and economic growth in China: evidence from rolling granger causality test. *Defence and Peace Economics*, **31**(5): 565-582.

Wijeweera, A. and Webb, M.J. 2011. Military spending and economic growth in South Asia: A panel data analysis. *Defence and Peace Economics*, **22**(5): 545-554.