Chapter 10
The Impact of Military Spending on Economic Development:
A Study of the Indian Economy

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ABSTRACT

Some countries spend a relatively large percentage of GDP on their militaries in order to preserve or secure their status as global powers. Others do so because they are ruled by military governments or aggressive regimes that pose a military threat to their neighbors or their own populations. It is debatable whether there is a causal relationship between military spending and economic growth in the economy. It is again a policy debate how much to allocate funds for civilian and how much for military expenditure. Under these puzzling results of the impact of military expenditure on economic growth which is frequently found to be non-significant or negative, yet most countries spend a large fraction of their GDP on defense and the military. The chapter tries to investigate the relationship between military spending and economic growth in India. It also sees whether external threats, corruption, and other relevant controls have any causal effect. This chapter obtains that additional expenditure on Indian military in the presence of additional threat is significantly detrimental to growth implying that India cannot afford to fight or demonstrate power at the cost of its development.

INTRODUCTION

It would be of stringent logic to hold the view that unproductive public expenditure like military expenditure slows down economic growth of a country. This is because when it comes to military spending, arguments and data often portray opposite results – that public expenditure boosts economic growth. Whatever may be the case, it is to be admitted that the relation between military expenditure and economic growth has received considerable empirical scrutiny but the debate is far from settled. Some countries spend a relatively large percentage of GDP on their militaries in order to preserve or secure their status as global powers. Others do so because they are ruled by military governments or aggressive regimes

that pose a military threat to their neighbors or their own populations. Some countries do so because they perceive themselves to be facing a serious military threat from neighboring countries or internal instability, whereas some others spend a relatively large percentage of GDP on their militaries because they have low GDPs.

It is debatable whether there is a causal relationship between military spending and economic growth in the economy. It is again a policy debate how much to allocate funds for civilian and how much for military expenditure. Under these puzzling results of the impact of military expenditure on economic growth which is frequently found to be non-significant or negative, yet most countries spend a large fraction of their GDP on defense and the military.

We know that due to the presence of external threats, expenditure on military has to be increased and such increase will also lead to higher economic growth as they would ensure a stable and calm economic and political business environment.

LITERATURE FREVIEW

The extant of some relevant literatures should be mentioned here to proceed for our present study. Benoit (1973; 1978) in her statistical findings and studies showed that, military expenditure enhances economic growth in most of the developing countries. This result was reinforced and reestablished later by many other studies (Lim, 1983; Grobar & Porter, 1989). To illustrate, Emile Benoit's interpretation of his 'chief regression results involved some startling statistical reasoning, including the notion that the portion of R^2 not accounted for by the regression variables can be discounted when assessing the statistical significance of a particular variable which is a convenient way of magnifying t-statistics.

Benoit's study stimulated many other economists for further thinking and empirical work on this subject. Broadly speaking, those studies suggest that it is largely inconclusive as some studies find no significant relation between military expenditure and economic growth; others find a negative relation and others still a positive one. On closer examination, however, evidence shows that military expenditure reduces economic growth.

The research question that most studies start with is that whether a high 'military burden' (that is military expenditure as a ratio to GDP) tends to lower economic growth in developing countries or not. There is a common answer that military expenditure promotes growth by stimulating aggregate demand and reducing excess capacity but this answer may be misleading because lack of demand is not a major constraint on medium-term growth in most developing countries. Even where demand needs to be stimulated, there is no reason to do it by building missiles rather than roads or schools. What is required is an evaluation of the opportunity cost of the military burden by considering the next best use of public resources other than military expenditure. The question then arises whether to reduce military expenditure and divert funds to other public expenditure or reduce total public expenditure as such.

In the original study of Benoit's, a more plausible argument is that military expenditure stimulates economic growth through various kinds of 'spillover effects' on civilian production. For example, major technological innovation like 'internet' by the military has a great influence on the civilian sector. Moreover, military infrastructure in developing countries has immense civilian uses like roads and satellites. Civilians are greatly relieved by the army during disasters. Again military establishment contributes to a country's efficiency, discipline and national unity (Benoit, 1978, pp. 277-8). The argument used

to be popular among political scientists in the1960s, but little empirical evidence has materialized in support of it. A more persuasive version is that military service contributes to the diffusion of skills. Weede (1992), in particular, has argued that military participation can be seen as 'a kind of school and an agency for human-capital formation' (p.227).

However, it should be taken into consideration that spillover effects boost economic growth only when they have to be strong enough to compensate for the expenditure involved. For example, the question arises as to why allot funs and ensure infrastructure to civilians indirectly through the military instead to directly providing with the same. A cost benefit analysis on this issue is warranted.

There is also a possibility of negative spillover effect owing to diversion f valuable and scarce funds to military purposes. It might slow down economic growth by the 'crowding-out effect'. In addition, there may be a 'distortion effect': aside from displacing other investments, military expenditure may reduce the efficiency of resource allocation in the economy, e.g. by distorting relative prices and fostering rent-seeking activities. There is also a possibility that military activities can generate disguised unemployment and destroy civilian facilities and the environment for military purposes.

The net effect of military expenditure on economic growth is a matter of empirical investigation. Much of the empirical evidence (aptly reviewed in Ram, 1995) consists of statistical analyses of international cross-section data, focusing on the association between military burdens and economic growth. The standard regression equation is of the form:

$$g_{i,t} = \beta X_{i,t} + \gamma X m_{i,t} + \epsilon_{i,t} . \ldots \ldots \qquad (1)$$

Where 'g' is the per-capita GDP, 'X' is the conditioning variable and 'm' is the military burden. Conditioning variables are chosen either on a structural model of the relation between military expenditure and economic growth, or on *ad hoc* statistical tests. The components of X include human capital, regional dummies, and the savings or investment rate.

OBJECTIVE

In this chapter, we consider a long-run impact of military expenditure on growth for India for the period 1970 to 2016. In Barro's (1990, 1991a, 1991b) model of cross-country growth regression investigation, where the coefficient of government expenditure on growth was found to be non-significant was extended later on to obtain that the impact of military expenditure is significantly negative (Barro & Sala-i-Martin, 1995)

Extending the model by Barro & Sala-i-Martin with the conjecture used by Joshua Aizenman and Reuven Glick (2006) that such findings are due to non-linearity and omitted variable biases; this chapter tests the case for India. The ultimate growth effects of military expenditure are traced only after controlling properly for the interaction between the intensity of threats and military expenditure.

THE MODEL

Like Aizenman and Glick (2006), we assume that the impact of military expenditure on growth is a non-linear function of the effective militarized threat posed by external forces and other foreign countries. We suppose / hypothesize that when there is external threat and no expenditure is made for military security, there will be a negative impact on growth. Moreover, when there is expenditure made on military grounds in absence of external threat, growth again is hampered. However, if there is military expenditure in the presence of sufficiently large threats, growth is increased.

Specifically, denoting growth by 'g', military expenditure by 'm' and threat by 'th', our conjecture can be written as:

$$\frac{\partial g}{\partial m} = a_1 + a_2.th \qquad\qquad a_1 \langle 0 \qquad a_2 \rangle 0 \,.$$

$$\frac{\partial g}{\partial th} = b_1 + b_2.th \qquad\qquad b_1 \langle 0 \qquad b_2 \rangle 0$$

It follows that we get the following growth equation which shows that the direct effects of military spending and external threats on growth are assumed to be negative and the indirect effect is positive.

$$g = a_1.m + a_2.th.m + b_1.th + \beta X \qquad\qquad a_1 < 0 \quad b_1 \langle 0 \qquad a_2 \rangle 0 \dots \qquad (2)$$

Where X is the set of control variables.

In this chapter, we consider three control variables, namely, initial level of GDP, percentage growth of population and net capital formation or net investment.

THE DATA

Data used I this analysis has been obtained from various sources. Growth rate, initial GDP, net national investment and population data has been obtained from Reserve bank of India website in their statistical section. For the threat variable, we have considered three aspects, namely, number of incidents that took place in a particular year, the number of death casualties that happened for the incidents and the number of injuries that occurred. We have calculated the threat index by assigning the following weights to each of the attributes used.

Threat Index (th) = (no. of incidents) x 3 + *(deaths)* x 5 + *(injuries)* x 0.25

It is to be admitted at the outset, that there can always be a better[1] threat index with better assignments of weights[2] to each component of the index. In our chapter, we have obtained the data on the threat aspects from Global Terrorism Database.

ANALYSIS OF RESULTS

Having obtained the data[3] and calculating our indices[4], we regress equation (2) and obtain the following results:

We also obtain the F statistic as 2.57 which is far above 0.97, the critical value of it at 5% level of significance. This implies that our model is statistically significant and can be used for predictive purposes. From table – 1, it is obtained that the variables 'm' and 'th' not only fail to be statistically significant, but also have coefficients very close to zero. It follows that neither the expenditure on military nor threat index can significantly influence growth. Hence, it might seem that there is almost no impact of military spending on economic growth and hence development.

However, it is very interesting to find that the estimated coefficient of the variable 'm.th' is statistically significant and its value is sufficiently negative. This shows that neither the expenditure on military nor threat index can individually significantly influence growth, but expenditure on military in the presence of threat can significantly influence growth and hence development.

CONCLUSION

India is the seventh largest country in area which has 15106.7 Km of land border running through 92 districts in 17 States and a coastline of 7516.6 Km touching 13 States and Union Territories (UTs). India also has a total of 1197 islands accounting for2094 Km of additional coastline. In fact, apart from dome states like Madhya Pradesh, Chhattisgarh, Jharkhand, Delhi and Haryana, all other States in the country have one or more international borders or a coastline and can be regarded as frontline States from the point of view of border management.

Six countries namely Bangladesh, China, Pakistan, Nepal, Myanmar, Bhutan and Afghanistan have boarders with India. Most of the borders are very sensitive due to Illegal migration, infiltration of anti-national elements, smuggling of arms/explosives and drug trafficking are some of the pressing problems. All this warrants strengthening of the Border Guarding Forces.

India spends a huge amount of GDP on military spending. Now the question is whether this spending of public money for defense purposes is economically justified. For the social cause or a political cause, needs an extension of this chapter. But this chapter can well say, from its findings, that a suomoto spending on military is not at all justified unless it is done when there is threat. As per our assumption of conjecture, it was expected that (a) military expenditure in the presence of threat is supposed to be significant, and, (b) such coefficient will be positive. Alarmingly, the coefficient is significant but

Table 1. Statistical results

	m	m.th	threats	initial gdp	% pg	Net inv	a
coeff	0.00	-5.09	0.00	0.00	0.00	0.09	16.07
se	0.00	2.95	0.00	0.00	0.00	2.77	9.29
t	1.08	-1.73	-1.49	-0.04	0.09	0.03	1.73
t (critical)	1.683851	1.683851	1.683851013	1.683851	1.683851	1.683851	1.683851
sig?		YES					YES

negative. It implies that additional expenditure on Indian military in the presence of additional threat is significantly detrimental to growth. It may be due to the fact that the marginal return of funds allocated to other productive sectors is more than if allocated to military purposes. In short, India cannot afford to fight or demonstrate power at the cost of its development.

This study can very well be extended for further research as the constant term of our estimate is significant implying possibility of presence of significance of other variables that were not considered in our study.

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KEY TERMS AND DEFINITIONS

Causality: Causality (also referred to as causation, or cause and effect) is the agency or efficacy that connects one process (the cause) with another process or state (the effect), where the first is understood to be partly responsible for the second, and the second is dependent on the first.

Economic Growth: Increase in the inflation-adjusted market value of the goods and services produced by an *economy* over time. It is conventionally measured as the percent rate of increase in real gross domestic product, or real GDP, usually in per capita terms.

External Threats: External threats are actions and positions against our national security which is a state or condition where our most cherished values and beliefs, our democratic way of life, our institutions

of governance and our unity, welfare, and wellbeing as a nation and people are permanently protected and continuously enhanced.

Intensity of Threats: Impact of the external threat measured by some specific index.

Military Spending: Public expenditure incurred on defense and non-civilian affairs.

Public Expenditure: The expenditure incurred by public authorities like central, state, and local governments to satisfy the collective social wants of the people.

Statistical Significance: Statistical significance means that a result from testing or experimenting is not likely to occur randomly or by chance, but is instead likely to be attributable to a specific cause.

APPENDIX

Table 2. The data set

Year	g	m	m.th	threats	initial gdp	% pg	net.inv
1970	6.5	2.976088	0	0	5616.3	2.23	757.77
1971	5	3.416743	0	0	5897.86	2.29	710
1972	1	3.479327	10.43798	3	5957.41	2.33	786.78
1973	-0.3	2.952315	0	0	5938.43	2.35	712.53
1974	4.6	2.995122	0	0	6208.72	2.36	922.22
1975	1.2	3.311121	76.15578	23	6280.79	2.35	817.89
1976	9	3.259161	9.777483	3	6846.34	2.33	653.69
1977	1.2	2.960441	8.881322	3	6931.91	2.31	838.55
1978	7.5	2.930082	0	0	7449.72	2.31	1050.63
1979	5.5	3.059146	672.2473	219.75	7859.64	2.32	1342.39
1980	-5.2	2.937503	347.3597	118.25	7450.83	2.33	1080.13
1981	7.2	2.986054	510.6153	171	7985.06	2.34	1193.27
1982	5.6	3.125042	1201.579	384.5	8434.26	2.35	1051.89
1983	2.9	3.106348	1522.887	490.25	8680.91	2.34	1063.01
1984	7.9	3.176781	4901.773	1543	9362.69	2.31	1149.19
1985	4	3.333858	1306.039	391.75	9733.57	2.28	1191.15
1986	4.2	3.829726	7769.556	2028.75	10138.66	2.24	1297.12
1987	4.3	3.948814	12380.52	3135.25	10576.12	2.2	1320.1
1988	3.5	3.727479	22969.66	6162.25	10949.92	2.17	1555.2
1989	10.2	3.530421	19538.24	5534.25	12062.43	2.13	1820.94
1990	6.1	3.244672	18956.99	5842.5	12802.28	2.01	1993.68
1991	5.3	3.001039	20747.68	6913.5	13478.89	2.06	2507.01
1992	1.4	2.789485	18690.24	6700.25	13671.71	2.02	1791.06
1993	5.4	2.911902	9144.099	3140.25	14405.03	1.99	2118.62
1994	5.7	2.748062	6505.349	2367.25	15223.43	1.96	2139.26
1995	6.4	2.659174	6637.299	2496	16196.94	1.94	2749.32
1996	7.3	2.550151	9466.797	3712.25	17377.4	1.92	2986.53
1997	8	2.73059	14193.61	5198	18763.19	1.89	2919.15
1998	4.3	2.812659	6400.91	2275.75	19570.31	1.86	3482.38
1999	6.7	3.049738	8550.702	2803.75	20878.27	1.83	3550.42
2000	8	3.041213	12414.23	4082	22549.42	1.79	4382.57
2001	4.1	3.015952	12902.24	4278	23484.81	1.77	3859.4

Table 2. Continued

Year	g	m	m.th	threats	initial gdp	% pg	net.inv
2002	5.4	2.91533	11092.1	3804.75	24749.62	1.71	3988.83
2003	3.9	2.761575	8957.858	3243.75	25709.35	1.67	4352.7
2004	8	2.917275	6509.169	2231.25	27757.49	1.63	5288.98
2005	7.1	2.841119	8676.778	3054	29714.64	1.59	7441.5
2006	9.5	2.605882	12105.63	4645.5	32530.73	1.55	8860.33
2007	9.6	2.415944	9358.763	3873.75	35643.64	1.51	10166.7
2008	9.3	2.629999	15129.73	5752.75	38966.36	1.47	12292.62
2009	6.7	2.984046	18210.14	6102.5	41586.76	1.43	11014.3
2010	8.6	2.792193	17333.23	6207.75	45160.71	1.38	13193.56
2011	8.9	2.651497	12013.27	4530.75	49185.33	1.34	15301.97
2012	6.7	2.537346	8413.204	3315.75	52475.3	1.29	15554.25
2013	5.4	2.472726	11398.65	4609.75	85465.52	1.26	16099.25
2014	6.3	2.49677	13043.13	5224	90843.69	1.23	23551.78
2015	7.1	2.405128	11406.92	4742.75	97274.9	1.22	25853.56
2016	7.2	2.474853	13767.61	5563	104271.91	1.2	27607.05

Table 3.

Year	Incident	Death	Injury	Terrorism Index (th)
1970	0	0	0	0
1971	0	0	0	0
1972	1	0	0	3
1973	0	0	0	0
1974	0	0	0	0
1975	1	4	0	23
1976	1	0	0	3
1977	1	0	0	3
1978	0	0	0	0
1979	20	31	19	219.75
1980	10	17	13	118.25
1981	16	24	12	171
1982	13	64	102	384.5
1983	47	59	217	490.25
1984	159	195	364	1543

Table 3. Continued

Year	Incident	Death	Injury	Terrorism Index (th)
1985	39	51	79	391.75
1986	96	340	163	2028.75
1987	166	506	429	3135.25
1988	358	966	1,033	6162.25
1989	324	874	769	5534.25
1990	349	907	1,042	5842.5
1991	339	1,113	1,326	6913.5
1992	237	1,152	917	6700.25
1993	42	525	1,557	3140.25
1994	107	389	405	2367.25
1995	179	361	616	2496
1996	211	569	937	3712.25
1997	193	853	1,416	5198
1998	61	398	411	2275.75
1999	112	464	591	2803.75
2000	179	671	760	4082
2001	234	658	1,144	4278
2002	182	593	1,175	3804.75
2003	196	472	1,183	3243.75
2004	108	334	949	2231.25
2005	145	463	1,216	3054
2006	167	722	2,138	4645.5
2007	149	626	1,187	3873.75
2008	516	763	1,559	5752.75
2009	673	774	854	6102.5
2010	661	812	659	6207.75
2011	643	484	727	4530.75
2012	611	264	651	3315.75
2013	694	467	771	4609.75
2014	860	490	776	5224
2015	882	387	647	4742.75
2016	1,019	462	784	5563

[1]comprising other components like amount of damage of property, feel of terror and insecurity, duration of the incidents, amount area affected in the country, amount of imports and exports hampered, impact on tourism, type of action taken by the country, type of retaliation by the country, distance of the external force from the border and so on.

[2] This chapter assigns the 3, 5 and 0.25 respectively to incidents, deaths and injuries. However, it is admitted that these weights are to-some-extent arbitrary (motivated from Global Terrorism Database and COW estimates) and a separate section is to be developed to obtain required weights as per the data, time frame and country considered.

[3]See Table 2 in Appendix

[4]See Table 3 in Appendix