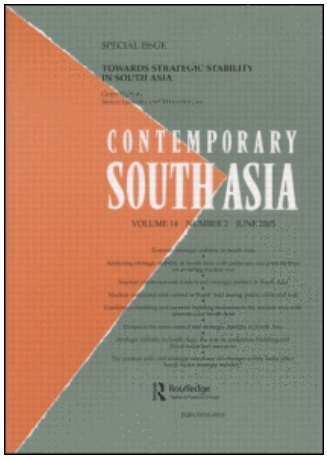

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Robert Looney; Robert McNab

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Pakistan's economic and security dilemma: expanded defence expenditures and the relative governance syndrome

ROBERT LOONEY & ROBERT MCNAB

ABSTRACT *For many years, conventional wisdom stressed that developing countries such as Pakistan face a guns versus butter trade-off, with increased defence expenditures coming at the expense of improved economic growth. Later, statistical studies suggested that, depending on the circumstances, defence expenditures could either aid or hinder economic growth. However, these studies were silent on the key role governance structures played in affecting the environments in which defence expenditures occur. Our findings suggest that governance patterns relative to defence determine to a large extent whether increased defence allocations interact with the economy in a positive or negative fashion. Unfortunately for Pakistan, defence expenditures have outrun governance to the extent that their impacts on the economy are negative. Furthermore, this effect is likely to persist even if defence expenditures are significantly reduced. Improved governance is the only option open to the authorities in their attempts to neutralise the adverse impacts of military expenditures.*

As one of the central countries in the 'War on Terror', Pakistan's defence and economic policies have import of a global scale. Faced with the challenge of restless tribal areas bordering Afghanistan, the continued dispute with India over Kashmir, and internal discontent from the liberal and conservative ends of the political spectrum, the administration of President Pervez Musharraf faces a diverse set of internal and external security challenges. Without security and sustained economic growth, the fragility of Pakistan is likely only to increase, impairing the effort to bring stability to Afghanistan and the security of India and other states in South Asia.[1]

Recent economic growth in Pakistan, as measured by the annual percentage change in the Gross Domestic Product (GDP) and bolstered by an influx of foreign

Correspondence: Robert Looney, National Security Affairs, 1 University Circle, Naval Postgraduate School, Monterey, CA 93943-5138, USA. E-mail: relooney@nps.edu

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aid and renewed access to global markets, has averaged approximately 6% since 2001. Robust growth translated to a 10% decline in poverty levels during this period. Yet the government's fiscal deficit, the result of low revenue mobilisation and increased expenditures, has remained above 4% of the GDP since 2001 except for 2004. Inflation continues to threaten the gains of the past 6 years, reaching 9% per annum in 2005 before declining to 7.9% in 2006.[2]

At the same time, Pakistan's military expenditures increased dramatically, averaging an annual increase of approximately 12% since 2001, approaching 30% of overall central government expenditures in 2005 (see Figure 1). The upward tend in Pakistan's military expenditures is not likely to end soon. The Government, for example, started the joint production of the Chinese JF-17 multi-role attack aircraft in 2005, approved the purchase of 44 F-16 fighter aircraft from the United States in 2006, and placed the first two of 150 planned JF-17s into service in 2007. While the United States is subsidising part of the modernisation of the Pakistani military,[3] a significant portion of military expenditures comes from the domestic budget at the cost of other expenditures that could promote and sustain economic growth.

Coupled with increased natural resource scarcity and the degradation of the national infrastructure, a slowdown in Pakistan's economic growth is likely to increase domestic instability, increasing pressure to further increase military expenditures. Previous attempts to expand the size of the military, however, have generated adverse economic impacts, including lower levels of infrastructure

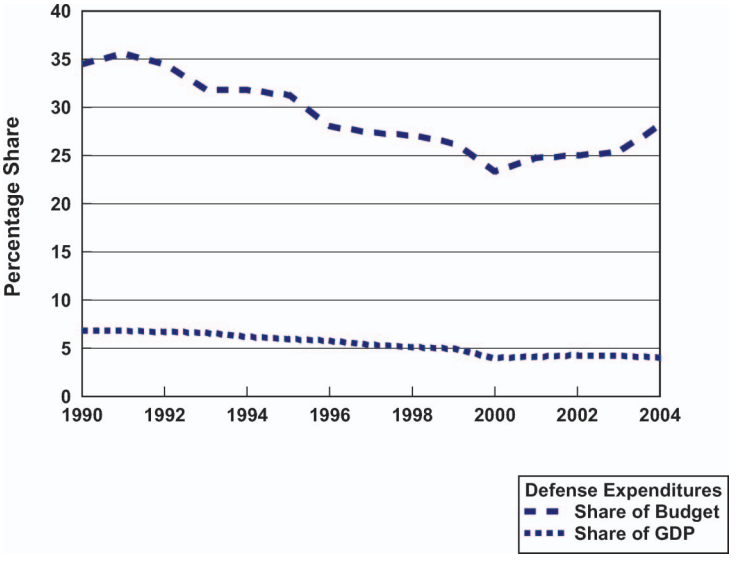

Figure 1. Pakistan: trends in defence expenditures.
Source: Adapted from Government of Pakistan, *Economic Survey, 2005–2006*, Islamabad: Finance Division, Economic Advisor's Wing 2006, Consolidated Federal and Provisional Government Expenditures, Table 4.4, p 321.

investment, inflation, increased indebtedness, and slower rates of economic growth.[4] There is also considerable evidence that, even during periods of normal levels of defence expenditures, the impact on the country's economic growth is also negative.[5] Pakistan thus appears to be faced with a clear choice: attempt to invigorate short-term security through increased military expenditures, or attempt to invigorate long-term economic growth (and hence security) by shifting resources from defence to socially oriented expenditures.

The challenge facing Pakistan and other developing countries is how to reform existing economic and governance institutions to promote economic development in the long run while fostering domestic security in the short run. It is becoming increasingly apparent that a long-term commitment to economic growth and the alleviation of poverty is the best way to combat the pull of terrorism in developing countries.[6] In this paper, we explore the linkages between military expenditures and other components of Pakistan's economy, attempting to discern whether military expenditures positively or negatively influence economic liberalisation and growth. We further discuss whether there is a nexus between existing economic and governance structures and military expenditures that explains why countries with similar levels of military expenditures grow at dissimilar rates.

The remainder of the paper is structured as follows. In the following section, we briefly review the literature on defence expenditures and economic growth. We then turn to the question of how to model this relationship. In the fourth section, we present and discuss the empirical results. In the final section, we make recommendations for Pakistan's future defence budgets and governance/economic liberalisation reform efforts.

Brief review of the literature

Ever since Emile Benoit's seminal work in the 1970s,[7] economists, political scientists and policy planners have closely examined the question of what is the impact of defence expenditures on the economy, and specifically economic growth. The research to date continues to debate whether Benoit's conclusion of a positive relationship between defence expenditures and economic growth in developing countries is conditional on other economic and political factors. Yet, for all the rather voluminous debate in the literature, there remains no clear conclusion on the sign or direction of causality between defence expenditures and economic growth.[8]

Two strands emerge in the literature on the relationship between defence expenditures and economic growth. In the first, defence expenditure is seen as perhaps stimulating economic growth, especially in countries with high rates of unemployment and underemployment. Increased defence expenditures may directly impact the level of human capital and provide technology transfer that would otherwise not be obtainable by relatively poor countries. From this perspective, increases in defence expenditures improve short-term and long-term prospects for economic growth.[9]

By contrast, the second strand sees that increases in defence expenditures may negatively impact economic growth by diverting scarce resources from socially oriented programmes. Contemporaneous consumption-oriented public expenditures appear to positively influence economic growth, suggesting that developing countries could increase economic growth by reallocating resources from military expenditures to consumption-oriented expenditures.[10] Countries with higher levels of defence expenditures also tend to be more corrupt. In addition, they have poorer public health outcomes. Finally, we observe that democratic governance affects the composition of public expenditures. That is, as a country becomes more democratic, the proportion of its public resources expended on defence decline. From this perspective, increases in defence expenditures negatively affect economic and social well-being due to the opportunity costs of defence spending and the lack of positive externalities.[11]

A more recent innovation starts from the conclusion in the determinants of economic growth literature that the impact of military expenditures is indeterminate. This lack of consensus may result from non-linearities in the relationship between military expenditure and economic growth.[12] The impact of defence expenditures, from this perspective, is conditional upon the security environment. Increases in defence expenditures in response to a deterioration in the security environment results in increased rates of economic growth. However, when the security environment is non-threatening, increases in defence expenditures may be the result of rent-seeking behaviour, and thus decrease economic growth.

The above strands of literature pose important questions for Pakistan. If there is a negative relationship between defence expenditures and economic growth, then its current build-up is likely to come at the cost of economic growth—and, hence, security—in the future. However, if the security environment is not sufficiently permissive to award entrepreneurial behaviour or a positive relationship exists, then the current increase in defence expenditures may induce economic growth and improve security in the long run. Finally, if democratic governance influences the composition of public expenditures and economic growth, then the influence of military expenditures may be exacerbated or mitigated by governance capacity and quality. To answer these questions, we turn to the question of modelling the relationship between defence expenditures and economic growth.

Modelling the relationship between defence expenditures and economic growth

Is there is a statistically significant linkage between defence expenditures and economic growth? We first attempt to replicate the results in the literature with respect to this relationship. We then examine whether more refined results can be obtained by separating the relatively heterogeneous sample into more homogeneous subsamples. Finally, we examine whether the democratic governance environment influences the relationship between defence expenditures and economic growth.

The data

As we are attempting to address the impact of an increase in military expenditures in Pakistan on economic growth, we focus on a relatively recent sample of data. From the 2005 *World Development Indicators*,[13] we obtain macro-economic data for 95 countries for the period 2000 – 2003. We then construct averages of the variables across this period to mitigate the influence of annual variations in the data in that we are interested in the average response over the sample time period.

The average annual rate of change in per-capita GDP is the dependent variable of interest 'GDP growth'. We investigate whether changes in the average annual growth of per-capita GDP are influenced by the formation of domestic and foreign capital accumulation, foreign aid and military expenditures. We use observed and reported military expenditures as a share of GDP or 'Military' to estimate the impact of the defence sector on economic growth. With respect to the other control variables, we utilise average gross fixed capital formation, or 'Fixed Capital', to capture the net new investment by enterprises in the domestic economy in fixed capital assets during the sample period. Average foreign aid per capita, or 'Aid', is used as a proxy for the reliance of the economy on inflows of aid. Average gross foreign direct investment (FDI), as a share of the GDP, measures the extent to which foreigners invest in the domestic economy and can be viewed as a proxy for the riskiness of a country.

We also employ two measures of economic freedom in our empirical analysis. James Gwartney and Robert Lawson employ the assumption that measures of personal choice, voluntary exchange, freedom to compete and protection of individual property and liberties adequately capture to construct the Economic Freedom of the World index.[14] The Heritage Foundation and *The Wall Street Journal* compile another index of economic freedom, which focuses on the relative progress made by countries in moving to a deregulated, limited government, free-market environment.[15] Institutions and policies are considered supportive of economic freedom when they provide a framework for voluntary exchange and protection of individuals and their property from unlawful expropriation.

While there has been a significant increase in the number of democratic governance indicators over the past decade, many of the more recent indicators lack a time-wise dimension. We choose to employ the innovative governance indicators constructed by Daniel Kaufman, Aart Kraay and Pablo Zoido-Lobaton and, most recently, by Daniel Kaufman, Aart Kraay and Massimo Mastruzzi that cover 199 countries and territories for 1996, 1998, 2000, and 2004. We do recognise that democratic governance, much like economic freedom, is a process that should be measured in multiple dimensions and that the composite measure may fail to capture all the dimensions of democratic governance. The advantages of these measures are consistency with the literature on governance issues and comparability across countries and time. Table 1 presents the sample countries, while Table 2 presents descriptive statistics of these variables.

Table 1. Countries in the analysis

Country	Defence % of GDP (average 2000–2003)	GDP growth (average 2000–2003)	High/low military grouping	Discriminant high/low military–governance grouping
Pakistan	**4.123**	**1.153**	**2.00**	**2.00**
Bangladesh	1.290	3.410	1.00	1.00
India	2.301	3.795	1.00	1.00
Sri Lanka	3.505	2.175	2.00	2.00
Albania	1.234	5.819	1.00	1.00
Algeria	3.528	2.401	2.00	2.00
Angola	4.016	3.471	2.00	2.00
Argentina	1.257	−2.651	1.00	1.00
*Armenia	3.018	11.447	2.00	1.00
Australia	1.829	1.918	1.00	1.00
**Austria	0.791	1.263	1.00	2.00
**Azerbaijan	1.998	9.838	1.00	2.00
Bahrain	4.205	1.356	2.00	2.00
Belarus	1.333	5.979	1.00	1.00
Belgium	1.328	1.204	1.00	1.00
Bolivia	1.630	0.276	1.00	1.00
*Bosnia	9.011	2.450	2.00	1.00
*Botswana	3.744	4.499	2.00	1.00
Brazil	1.441	0.591	1.00	1.00
Bulgaria	2.624	5.937	1.00	1.00
Burkina Faso	1.382	2.109	1.00	1.00
Burundi	6.931	−0.511	2.00	2.00
*Cambodia	2.707	3.900	2.00	1.00
Cameroon	1.490	2.414	1.00	1.00
Canada	1.180	2.179	1.00	1.00
Cape Verde	0.892	2.304	1.00	1.00
Central African Republic	1.076	−2.440	1.00	1.00
**Chad	1.477	4.487	1.00	2.00
*Chile	3.707	1.915	2.00	1.00
**China	2.241	7.538	1.00	2.00
Colombia	3.852	0.760	2.00	2.00
**Congo, Democratic Republic of	0.977	−2.388	1.00	2.00
**Congo, Republic of	1.370	1.445	1.00	2.00
**Cote d'Ivoire	1.551	−3.936	1.00	2.00
Croatia	2.517	4.815	1.00	1.00
Cyprus	1.922	3.234	1.00	1.00
Czech Republic	1.954	2.986	1.00	1.00
Denmark	1.558	1.137	1.00	1.00
Ecuador	2.037	1.921	1.00	1.00
Egypt	2.739	1.862	2.00	2.00

(*continued*)

Table 1. (*Continued*)

Country	Defence % of GDP (average 2000 – 2003)	GDP growth (average 2000 – 2003)	High/low military grouping	Discriminant high/low military – governance grouping
El Salvador	0.089	0.313	1.00	1.00
Eritrea	26.125	−2.399	2.00	2.00
Estonia	1.647	7.092	1.00	1.00
Ethiopia	6.412	1.173	2.00	2.00
Fiji	2.050	1.197	1.00	1.00
Finland	1.217	2.353	1.00	1.00
France	2.555	1.395	1.00	1.00
Gambia	0.877	0.799	1.00	1.00
Georgia	0.857	6.635	1.00	1.00
Germany	1.478	0.806	1.00	1.00
Ghana	0.726	2.570	1.00	1.00
*Greece	4.469	3.803	2.00	1.00
Guatemala	0.639	−0.064	1.00	1.00
**Guinea	2.428	0.566	1.00	2.00
*Guinea-Bissau	3.765	−2.531	2.00	1.00
Honduras	0.706	0.767	1.00	1.00
Hungary	1.794	3.751	1.00	1.00
Indonesia	1.140	2.668	1.00	1.00
Iran	4.118	4.122	2.00	2.00
Ireland	0.683	5.143	1.00	1.00
Israel	8.385	−0.285	2.00	2.00
Italy	2.009	1.351	1.00	1.00
Japan	0.983	1.212	1.00	1.00
Jordan	8.562	1.251	2.00	2.00
Kazakhstan	0.932	11.336	1.00	1.00
Kenya	1.794	−1.078	1.00	1.00
Korea, South	2.446	4.868	1.00	1.00
Kuwait	9.923	−0.171	2.00	2.00
Kyrgyz Republic	1.510	3.376	1.00	1.00
**Lao PDR	2.066	2.953	1.00	2.00
Latvia	1.329	7.988	1.00	1.00
Lebanon	4.837	0.299	2.00	2.00
*Lesotho	3.085	1.939	2.00	1.00
Liberia	7.565	−2.782	2.00	2.00
Libya	2.815		2.00	2.00
Lithuania	1.783	7.090	1.00	1.00
Luxembourg	0.799	2.612	1.00	1.00
*Macedonia	3.529	0.629	2.00	1.00
Madagascar	1.327	−0.941	1.00	1.00
Malawi	0.866	−1.450	1.00	1.00

(*continued*)

Table 1. (*Continued*)

Country	Defence % of GDP (average 2000–2003)	GDP growth (average 2000–2003)	High/low military grouping	Discriminant high/low military–governance grouping
**Malaysia	2.143	2.406	1.00	2.00
Mali	2.220	3.896	1.00	1.00
Malta	0.755	0.722	1.00	1.00
*Mauritania	1.815	1.713	1.00	2.00
Mauritius	0.214	3.537	1.00	1.00
Mexico	0.506	0.666	1.00	1.00
Moldova	0.405	5.883	1.00	1.00
Mongolia	2.353	1.874	1.00	1.00
Morocco	4.180	2.265	2.00	2.00
Mozambique	2.407	5.060	1.00	1.00
**Myanmar	2.305	10.225	1.00	2.00
*Namibia	2.882	0.653	2.00	1.00
**Nepal	1.222	1.181	1.00	2.00
Netherlands	1.609	0.350	1.00	1.00
New Zealand	1.130	2.343	1.00	1.00
Nicaragua	0.812	0.008	1.00	1.00
Niger	1.018	0.364	1.00	1.00
Nigeria	1.059	2.383	1.00	1.00
Norway	1.904	1.265	1.00	1.00
Oman	11.673	2.219	2.00	2.00
Papua New Guinea	0.893	−2.732	1.00	1.00
Paraguay	0.908	−1.620	1.00	1.00
Peru	1.660	1.381	1.00	1.00
Philippines	1.027	2.276	1.00	1.00
Poland	1.851	2.838	1.00	1.00
Portugal	2.113	0.413	1.00	1.00
Romania	2.413	4.626	1.00	1.00
*Russia	4.046	7.312	2.00	1.00
Rwanda	3.460	3.334	2.00	2.00
Saudi Arabia	10.159	0.401	2.00	2.00
Senegal	1.461	2.162	1.00	1.00
*Serbia	4.519	12.467	2.00	1.00
Seychelles	1.696	−1.507	1.00	1.00
Sierra Leone	2.528	3.173	1.00	1.00
Singapore	5.030	1.020	2.00	2.00
Slovak Republic	1.800	3.631	1.00	1.00
Slovenia	1.380	2.982	1.00	1.00
South Africa	1.567	1.231	1.00	1.00
Spain	1.213	2.312	1.00	1.00
**Sudan	2.466	3.936	1.00	2.00

(*continued*)

Table 1. (*Continued*)

Country	Defence % of GDP (average 2000 – 2003)	GDP growth (average 2000 – 2003)	High/low military grouping	Discriminant high/low military – governance grouping
*Swaziland	1.803	0.313	1.00	2.00
Sweden	1.880	1.950	1.00	1.00
*Switzerland	1.036	0.385	1.00	1.00
Syria	6.273	−0.006	2.00	2.00
Tajikistan	1.236	8.817	1.00	1.00
Tanzania	1.409	4.151	1.00	1.00
Thailand	1.397	4.026	1.00	1.00
**Togo	1.639	−1.109	1.00	2.00
**Tunisia	1.626	3.018	1.00	2.00
Turkey	4.936	1.746	2.00	2.00
**Uganda	2.349	2.815	1.00	2.00
*Ukraine	3.052	8.276	2.00	1.00
United Arab Emirates	3.478	−1.389	2.00	2.00
United Kingdom	2.428	2.183	1.00	1.00
United States	3.425	1.328	2.00	2.00
Uruguay	1.584	−3.898	1.00	1.00
**Uzbekistan	0.835	2.917	1.00	2.00
Venezuela	1.480	−4.811	1.00	1.00
Yemen, Republic of	5.692	1.580	2.00	2.00
Zambia	0.576	2.380	1.00	1.00
Zimbabwe	3.858	−7.752	2.00	2.00

Notes: High military expenditures, those countries above or equal to the sample mean; low military expenditures, those countries below the sample mean. Discriminate grouping, based on discriminate analysis with military expenditure groups (high and low) as the initial groupings, and governance and economic freedom variables as the discriminating variables. *High military expenditure countries that, given their governance development, have environments similar to low defence expenditure countries. **High defence expenditure countries that, given their levels of governance, have environments similar to low defence expenditure countries.
Sources: Growth and military expenditure data from World Bank, *Development Indicators 2005* (Washington, DC: World Bank, 2005).

As noted above, the theoretical literature suggests that human capital and the changing threat environment may affect both the determinants of and economic impacts stemming from defence expenditures. Operationally, however, both concepts are fraught with a number of difficulties. Data on human capital simply do not exist for many countries, and those that do are often simply mechanically generated based on the number of years of education without corrections for quality. Similarly, the threat environment is also difficult to specify across

Table 2. Descriptive statistics of key variables

Variable (average values 2000–2003)	Mean	Standard deviation	Number of observations
Military expenditures (% GDP)	2.66	2.86	141
Gross Fixed Capital formation (% GDP)	20.43	6.31	141
Aid per capita	35.06	38.12	141
GDP per-capita growth (%)	2.20	3.11	141
Foreign direct investment (% GDP)	7.54	41.61	134

Source: World Bank, *World Development Indicators 2005* (Washington, DC: World Bank, 2005).

countries in any meaningful sense (it is a concept much better adapted to time-series analysis). As a result, in the analysis below we focus on the more universally applicable variables associated with governance and economic freedom. This represents the first time these variables have been systematically examined in the context of defence expenditures and their impacts.

Estimation approach

As discussed above, there is a distinct lack of consensus with respect to the relationship between defence expenditures and economic growth. Following the literature, our base estimation equation is:

$$\text{GDP Growth} = a + b_1\ \text{Military} + b_2\ \text{Fixed Capital} + b_3\ \text{Aid} + b_4\ \text{FDI}$$

A priori, we would expect that fixed capital accumulation and FDI would positively influence economic growth. More recent evidence suggests that foreign aid may negatively affect economic growth, thus we do not hypothesise a sign *a priori*.[16] Likewise, given the lack of consensus on the impact of defence expenditures on economic growth, we cannot sign the estimated coefficient *a priori*.

Our estimation approach is to first explore, using ordinary least-squares (OLS) analysis, whether we can replicate the results in the literature. Continuing to use OLS, we then examine the hypothesised relationship between economic growth and defence expenditures in a variety of subsamples organised by level of defence expenditure, voice and accountability, and economic freedom.

We then employ discriminant analysis to re-order the groups. We can discriminate between two groups of countries on the basis of observations on several variables; in this case, as measures of governance. The statistical problem is to develop a rule, or discriminant function, based on measurements obtained on each of the countries, which will help us assign countries to the correct population.[17] Discriminant analysis is similar to regression analysis in that both analyses attempt to describe, via a linear model, the relationship between a dependent and several independent variables; one for the primary purposes of discrimination, the other for the primary purpose of prediction. In this case, we use

linear discriminant analysis to develop a linear transformation ('discriminant function') that yields a new set of transformed values that provides a more accurate discrimination than either predictor alone. In other words, we can employ discriminant analysis to create new country groupings that, we argue, allow us to more accurately explore the relationship between defence expenditures and economic growth. We thus separate the countries in our analysis into two groupings, using the democratic governance scores to determine into which grouping each country is placed. Figure 2 summarises the main steps in the quantitative analysis.

Initial estimations

Turning to the question of the empirical relationship between defence expenditures and economic growth, we find that, for the full sample of countries, military expenditure appears to have a significantly negative influence the rate of economic growth (see Table 3, part 1). Yet a common criticism of the literature is that the results are dependent upon the composition of the sample; that is, one should not group unlike countries when conducting empirical analysis. We thus examine whether this relationship holds when we divide the sample into those with relatively 'low' defence burdens (those below the mean) and those with relatively 'high' defence burdens (those above the mean). For the task at hand, one compelling difference between countries is their defence burden (measured in terms of the share of the defence budget in GDP).

Defence burden

The mean of the average share of defence in the GDP from 2000 to 2003 is 2.66%, with the countries below this level averaging 1.49% while those above the mean average 5.49% (see Table 4). The South Asian countries are evenly split between groups with Pakistan and Sri Lanka in the high defence expenditure group and India and Bangladesh in the low defence group. Even greater differences in budgetary shares allocated to defence exist between the low defence and high defence countries, with allocations to the military in low defence countries averaging 6.3% of the budget as opposed to 18.35% in the high defence countries. Pakistan is somewhat above the mean with an average defence budgetary share of 24.29%. Using mean defence expenditure to create subsamples of low and high relative to the average defence expenditures, we find that there is no statistically significant relationship between defence expenditures and economic growth for the relatively low subsample. On the other hand, we find a statistically significant and negative relationship for the relatively high defence burden countries.

Voice and accountability

We then turn to the question of whether the relationship is dependent upon the level of voice and accountability present in a country. Here, we find

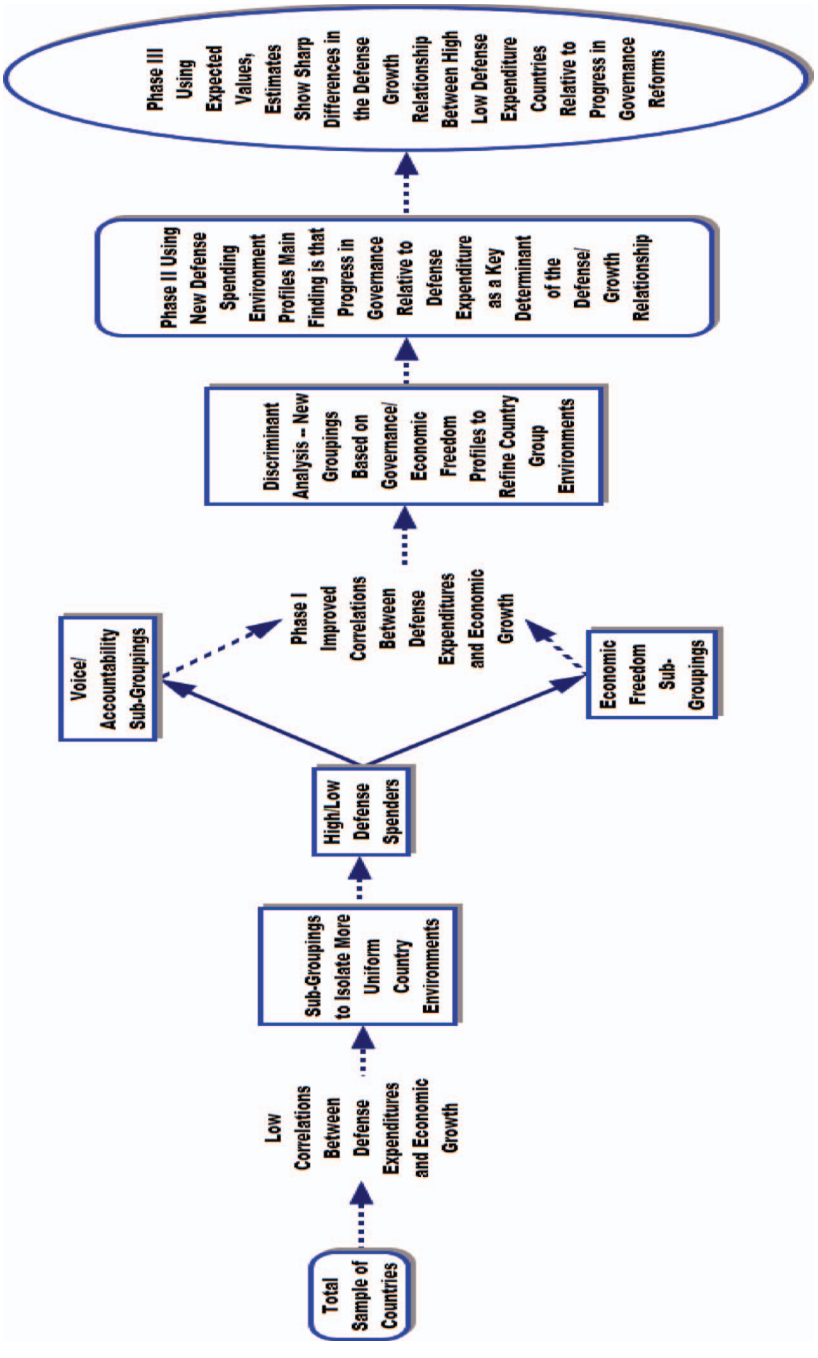

Figure 2. Overview of steps in analysis.

Table 3. Defence expenditures and economic growth: initial groupings

	MILXY	r^2 (adjusted)	Degrees of freedom
(1) Total sample of countries	(−)**	0.138	95
Main subgroupings			
(2) Levels of military expenditure			
Low spenders	(+)	0.162	65
High spenders	(−)**	0.169	29
(3) Levels of voice/accountability			
High (low military spending)	(−)	0.058	38
Low (high military spending)	(−)**	0.207	65
(4a) High levels of voice/accountability			
Low military spending	(+)	0.154	32
High military spending	(−)	0.203	5
(4b) Low levels of voice/accountability			
Low military spending	(−)	0.185	32
High military spending	(−)**	0.192	23
(5a) High levels of economic freedom			
Low military spending	(+)	0.286	22
High military spending	(−)	0.010	8
(5b) Low levels of economic freedom			
Low military spending	(+)**	0.658	27
High military spending	(−)*	0.281	11

Notes: OLS regression: MILXY (Defence expenditure as a % of GDP). **Statistically significant at a 95% level of confidence. *Statistically significant at a 90% level of confidence. (+), positive impact of military expenditures on per-capita GDP growth; (−), negative impact of military expenditures on per-capita GDP growth.
Source: All data from World Bank, *World Development Indicators 2005* (Washington, DC: World Bank, 2005).

that defence expenditures do not appear to significantly influence economic growth in countries with relatively high levels of voice and accountability. On the other hand, we note that defence expenditures appear to negatively influence economic growth in the subsample of countries whose voice and accountability is below the mean of the entire sample. Further examining this relationship, we explore the relationship within the subsamples; that is, we examine whether defence expenditures negatively influence economic growth in the subsample of countries with relatively high voice and accountability scores and relatively high within-subsample defence expenditures. Again, we find no statistically significant relationship among the relatively high voice and accountability countries. We also fail to detect a statistically significant relationship for the low voice – low defence expenditure countries. On the other hand, among the countries with relatively poor voice and accountability scores, we find a negatively relationship for those with relatively high levels of defence expenditures.

Table 4. Comparison of high/low defence expenditure countries

Group differences	Defence budgetary share	Defence expenditure (% GDP)	Military personnel (% labour force)	Health expenditure (% GDP)	Education expenditure (%GDP)
Group differences 2000 – 2003					
Low defence countries					
Mean	**6.30**	**1.49**	**0.99**	**6.03**	**4.50**
Bangladesh	13.81	1.29	0.26	3.17	2.39
India	14.38	2.30	0.51	6.17	4.11
High defence countries					
Mean	**18.35**	**5.49**	**3.08**	**6.00**	**4.40**
Pakistan	24.29	4.12	1.70	3.23	1.79
Sri Lanka	16.48	3.51	2.62	3.63	–
Group differences 1995 – 1999					
Low defence countries					
Mean	**7.24**	**1.57**	**1.13**	**5.85**	**4.16**
Bangladesh	–	1.42	0.28	3.15	2.40
India	15.11	2.23	0.53	5.45	3.61
High defence countries					
Mean	**20.82**	**5.78**	**3.44**	**6.06**	**4.38**
Pakistan	27.27	5.37	1.76	3.55	1.84
Sri Lanka	18.59	4.23	2.85	3.45	3.05

Source: Compiled from World Bank, *World Development Indicators 2005* (Washington, DC: World Bank, 2005).

Economic freedom

Looking at the question of whether economic institutions influence the impact of defence expenditures, we fail to note a statistically significant relationship. We then examine subsamples of relatively high and low levels of economic freedom and find no relationship among the relatively high economic freedom countries. Within the subsample of relatively low levels of economic freedom countries, however, we find that defence expenditures appear to influence economic growth. For the relatively low freedom, low expenditure countries, defence expenditures appear to have a positive influence on economic growth. For the relatively low freedom, high expenditure countries, however, we find that defence expenditures appear to negatively influence economic growth.

Summation

Our results above suggest that countries with relatively high levels of defence expenditures experience lower rates of economic growth. This result appears whether we organise our sample countries by the median level of defence expenditure, by voice and accountability, and by economic freedom. Our results

also suggest that this negative relationship primarily affects the poorest performers; that is, countries with relatively poor institutional quality. Pakistan falls into the relatively high defence burden – relatively low institutional quality groupings. Pakistan performs poorly with respect to voice and accountability and economic freedom, suggesting that increased defence expenditures may lower economic growth.

While these findings are suggestive of the ways in which defence expenditures may impact in Pakistan and our sample of other South Asian countries, the results need to be taken with great caution. Most importantly, our estimations have low explanatory power in many cases. Also, several of the country groupings contain a limited number of countries (low economic freedom/high defence spending group and the high economic freedom/high defence group), causing the degrees of freedom to be below normally acceptable ranges.

Employing discriminant analysis to refine groupings

While the analysis is the preceding section is informative, our analysis suffers from relatively low explanatory power with respect to the more focused country groupings. Our models explain, for example, only 16% of the variation in the subsample of countries with relatively low levels of defence expenditures, suggesting that we can either add explanatory variables or that our groupings can be improved.

To refine the country groupings, we employ discriminant analysis. Employing the measures of governance and economic freedom discussed earlier in the paper, we explore whether a linear combination exists that can be used to spilt the countries into subgroups. We first note that—of the variables available for analysis—only voice and accountability, political stability, and the rule of law were statistically significant predictors of relatively high or low defence expenditures. Using these three variables, we used discriminant analysis to assign a country to a 'high' or 'low' country grouping. These three variables correctly predicted 77% of the high defence and low defence countries as being assigned to the correct grouping. It is important to note that the discriminant analysis resulted in two subsamples: high defence burden/low voice and accountability, and low defence burden/high voice and accountability.

Using the new country groupings, we repeated the analysis of the previous section. In general, the results of the previous section were confirmed, but the explanatory power of the estimations was significantly greater than the previous section. This result tends to suggest that groupings developed via discriminant analysis were more appropriate than the subsamples based on a country's position relative to the mean value of the variable; that is, whether a country's defence expenditures were higher or lower than mean defence expenditures for the appropriate subsample. We thus now have countries ordered by the level of defence expenditures and the linear combination of the applicable governance

indicators. We remind the reader that the governance indicator used to create the subsamples is the result of the discriminant analysis and not an actual observation available from the data sources.

Defence burden

Taking the countries with relatively high defence burdens, we spilt them into two subsamples: those with relatively high within-group defence burdens, and those with relatively low within-group defence burdens (see Table 5). Defence expenditures appear to negatively and significantly retard economic growth for the subsample of relatively high defence spenders (Table 5, parts 1a – 1e). On other hand, defence expenditures do not appear to have a statistically significant influence on the rate of economic growth for countries with relatively defence burdens (Table 5, parts 2a – 2f). The explanatory power of the analysis for the high defence spenders is improved, in that we explain over 70% of the variation in the high defence sample of countries. These results suggest that governance influences how defence expenditures interact with economic growth.

Table 5. Defence expenditures by governance environments

	MILXY	r^2 (adjusted)	Degrees of freedom
(1) High defence profile countries	(−)**	0.505	30
Subgroupings			
(1a) High defence spenders	(−)**	0.728	18
(1b) Low defence spenders	(+)**	0.789	11
(1c) Growth over-achievers	(−)**	0.934	12
(1d) Growth under-achievers	(−)**	0.562	17
(1e) Defence higher than predicted by governance	(−)**	0.775	14
(1f) Defence lower than predicted by governance	(−)	0.527	15
(2) Low defence profile countries	(+)	0.020	64
Subgroupings			
(2a) High defence spenders	(−)	0.056	10
(2b) Low defence spenders	(+)	0.039	53
(2c) Growth over-achievers	(−)	0.015	30
(2d) Growth under-achievers	(+)	0.238	33
(2e) Defence higher than predicted by governance	(−)	0.055	34
(2f) Defence lower than predicted by governance	(−)	0.103	29

Notes: OLS regression: MILXY (Defence expenditure as a % of GDP). **Statistically significant at a 95% level of confidence. *Statistically significant at a 90% level of confidence. (+), positive impact of military expenditures on per-capita GDP growth; (−), negative impact of military expenditures on per-capita GDP growth.
Source: All data from World Bank, *World Development Indicators 2005* (Washington, DC: World Bank, 2005).

Expected defence burden

We then turn to the question of how governance influences the impact of defence expenditures on economic growth. We thus create two additional variables: 'P-Military', the level of predicted defence expenditures as a share of GDP conditional on the governance structures; and 'D-Military', the difference between the expected level of defence expenditures and the actual level of defence expenditures. We argue that these variables allow us to identify more subtle linkages between democratic governance and defence expenditures.

If high defence expenditures relative to governance are the key link between defence expenditures and economic performance, then positive differences between the actual level and that expected (given governance) can be expected to be statistically significant. If the reverse is the case, then we can expect countries to reap positive benefits by lower defence expenditures.

Continuing to employ the country groupings resulting from the discriminant analysis, we find that the level of expected defence expenditures, conditional on governance, does has a statistically significant negative influence on economic growth (Table 6, parts 1a, 2, 2a, and 2c). On the other hand, we find that for the lower defence expenditure/higher governance countries, defence expenditures can have a positive impact on economic growth (Table 7).

Table 6. Anticipated defence spending in high defence/low governance environments

	DEFENCE	r^2 (adjusted)	Degrees of freedom
(1) High defence profile countries (MILXYE)	(−)	0.407	30
Subgroupings			
(1a) Defence higher than predicted by governance	(−)**	0.400	14
(1b) Defence lower than predicted by governance	(−)	0.548	15
(1c) High defence spenders	(−)	0.104	18
(1d) Low defence spenders	(−)	0.608	11
(2) High defence profile countries (DMILXDF)	(−)**	0.493	30
Subgroupings			
(2a) Defence higher than predicted by governance	(−)**	0.735	14
(2b) Defence lower than predicted by governance	(+)	0.543	15
(2c) High defence spenders	(−)**	0.699	18
(2d) Low defence spenders	(+)	0.683	11

Notes: OLS regression: DEFENCE (expected defence expenditure, conditional on governance). **Statistically significant at a 95% level of confidence. *Statistically significant at a 90% level of confidence. (+), positive impact of military expenditures on per-capita GDP growth; (−), negative impact of military expenditures on per-capita GDP growth.

Source: All data from World Bank, *World Development Indicators 2005* (Washington, DC: World Bank, 2005).

Table 7. Anticipated defence spending in low defence/high governance environments

	DEFENCE	r^2 (adjusted)	Degrees of freedom
(1) Low defence profile countries (MILXYE)	(−)	0.005	64
Subgroupings			
(1a) Defence higher than predicted by governance	(+)	0.078	34
(1b) Defence lower than predicted by governance	(+)**	0.199	29
(1c) High defence spenders	(+)	0.457	10
(1d) Low defence spenders	(+)**	0.146	53
(2) Low defense profile countries (DMILXDF)	(−)	0.005	64
Subgroupings			
(2a) Defence higher than predicted by governance	(−)	0.061	34
(2b) Defence lower than predicted by governance	(+)**	0.227	29
(1c) High defence spenders	(−)	0.100	10
(1d) Low defence spenders	(−)	0.045	53

Notes: OLS regression: DEFENCE (expected defence expenditure, conditional on governance). **Statistically significant at a 95% level of confidence. *Statistically significant at a 90% level of confidence. (+), positive impact of military expenditures on per-capita GDP growth; (−), negative impact of military expenditures on per-capita GDP growth.
Source: All data from World Bank, *World Development Indicators 2005* (Washington, DC: World Bank, 2005).

Summation

Our analysis suggests a clear pattern across a number of model specifications whereby high defence countries experience negative impacts on economic growth stemming from increased military expenditures. This pattern is reinforced in countries whose actual expenditures exceed predicted expenditures, conditional on governance structures. Low defence spending countries can obtain positive benefits from defence by cutting back their allocations to the military further than that normally associated with governance structures. Bangladesh, for example, is in a group of countries that obtains no positive benefit from their low level of defence. On the other hand, if low defence spending countries can cut back their expenditures further than the norm for their governance, defence expenditures should have a stimulating impact on economic growth. Unfortunately, for the high defence spending countries such as Pakistan, just cutting defence expenditures back below the norm for their level of governance may eliminate their negative impact on growth, but it is unlikely to produce a positive stimulus.

Conclusions

In this paper, we have examined whether there is a statistically significant relationship between defence expenditures and economic growth, and whether the level of governance in the sample countries influences this relationship. We have found evidence to suggest that those countries with poor institutional quality or

capacity, as proxies by governance indicators on voice, accountability, and democracy, should be wary of expanding defence expenditures. For these countries, which are relatively less free and already expend relatively more on defence, increases in defence expenditures retard economic growth.

With respect to Pakistan, these findings should serve as a significant warning as to the trade-offs associated with the current and projected increases in defence expenditures. The capacity for and level of democratic governance has suffered under President Musharraf's government, further inhibiting the ability of Pakistan to manage increases in defence expenditures. Drawing from our findings, we believe that if Pakistan continues to aggressively modernise its armed forces, it will, at some point, need to mobilise increasing amounts of revenue. This revenue is unlikely to come from additional taxes, given Pakistan's historically poor performing tax system, and thus it will come from either shifting resources within the current budget, debt, or significant increases in external aid.

Our findings and the literature suggest that the opportunity cost of these increased expenditures will be relatively high in the long run. Pakistan's economic infrastructure will continue to deteriorate, further degrading its ability to generate economic growth, and increasing domestic instability. This destructive cycle of increased defence expenditures – reduced economic growth can be mitigated, however, if Pakistan is able to increase institutional capacity and quality.

Yet, as instability rises, the ability and willingness of the government to implement governance reforms is likely to decline.[18] Ironically, one of the most effective means of improving growth prospects, and hence security, may be denied to Pakistan during its current administration due to the almost singular focus of Pakistan and the United States on security related issues. Sadly, the short-sighted diversion of scarce resources to increased defence expenditures may, in the long run, destabilise Pakistan and create even greater levels of insecurity in the region.

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