The major strand of the literature on the statistical relationship between military spending and economic growth comes from the field of development economics, where a host of studies have attempted to determine the influence of defense expenditures on economic development. According to the conventional wisdom—which is encapsulated in the official policy of lending institutions such as the World Bank and International Monetary Fund (IMF)—government expenditures on national defense carry an opportunity cost in the form of lower economic output and slower rates of output growth.\(^1\) The theoretical assumption is that resources spent on preparation for war, and on warfighting itself, could be better employed elsewhere. In particular, the devotion of valuable human capital to military rather than civilian research and development is assumed to significantly retard economic growth. Thus, a popular assumption for researchers and policymakers alike is that the influence of military spending on economic growth is negative.

But the empirical evidence on the military expenditures–growth relationship is decidedly ambiguous. In a study of 44 developing economies, for example, Benoit (1973) found no evidence that defense spending has an adverse effect on growth. In fact, even after controlling for reductions in foreign investment and aid as a result of military spending, the correlation between military expenditures and economic growth remained positive. More recently, a study by Babin (1986) looked at 88 developing economies from 1965 to 1981.

\(^1\)See, for example, Nelson (1963), Benoit (1968), and Knight et al. (1996).
Babin also found a consistently positive relationship and concluded that military stability—which requires military capability—is an important precondition for economic advancement in the Third World.²

A second and much smaller strand of the literature explicitly considers the impact of economic growth on military expenditures. One example is Looney (1994), where data from 1965 to 1987 are used to construct a system of equations that allow for the relative influence of resource availability, trade patterns, indigenous arms production, and other political and strategic, as well as economic, variables. For arms producers as well as nonproducers, the model suggests that economic production has a significant positive influence on defense spending.

Still a third strand of the literature uses purely statistical, or “atheoretical” techniques to determine the relationship between military spending and growth. Smith (1989) takes an iterative approach to modeling the relationship, setting up alternatives and then using a series of specification tests to determine which alternatives best fit the data. In an examination of British military expenditures post-1945, Smith found that military expenditures are a positive function of economic performance and the relative price of military and nonmilitary goods, as well as security variables based on threat appreciation and military alliances. In a test of the model’s applicability to other countries, Smith found it also fit data for France.

Chowdhury (1991) and Kusi (1994) each conducted tests of the direction of statistical causality between military expenditures and growth. A summary of their findings is presented in Table 2.1. In both studies, the results suggest that the relationship between defense spending and economic growth cannot be generalized across countries. However, where a relationship does appear to exist, there is slightly more evidence to suggest that increases in military expenditures anticipate declines in economic growth, while increases in economic growth anticipate increases in military expenditures.³

²This conclusion is consistent with arguments presented in Wolf (1981).
³The results of these studies are susceptible to the problems associated with Granger’s (1969) causality estimation, namely the potential bias of the estimators because of inappropriate lag estimation, and the problems associated with errors in the source
Table 2.1
Comparison of Causality Results, Chowdhury (1991) and Kusi (1994)

<table>
<thead>
<tr>
<th>Sample and Findings</th>
<th>Chowdhury</th>
<th>Kusi</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of countries</td>
<td>55</td>
<td>77</td>
</tr>
<tr>
<td>Number (percent) of countries with result:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No statistically significant causal relationship</td>
<td>30 (55)</td>
<td>62 (80)</td>
</tr>
<tr>
<td>Military expenditures reduced economic growth</td>
<td>15 (27)</td>
<td>3 (4)</td>
</tr>
<tr>
<td>Military expenditures increased economic growth</td>
<td>0</td>
<td>4 (5)</td>
</tr>
<tr>
<td>Economic growth reduced military expenditures</td>
<td>1 (2)</td>
<td>1 (1)</td>
</tr>
<tr>
<td>Economic growth increased military expenditures</td>
<td>9 (16)</td>
<td>6 (8)</td>
</tr>
</tbody>
</table>

Finally, a fourth strand of the literature traces its approach to the seminal model of an arms race developed by Richardson (1960). In Richardson-type models, arms acquisitions are described in terms of simultaneous linear reaction functions, where states change their levels of military expenditure in response to the level of military expenditure in rival states. A recent model of this type is Looney (1990), in which the causal factors behind the arms races in the Middle East are explored. Applying a Hsiao test to different pairs of countries, Looney identifies the sequence of steps that contribute to each bilateral arms race.\(^4\) Looney identifies four possible cases:

1. Defense (A) causes defense (B)
2. Defense (B) causes defense (A)
3. Joint causality between (A) and (B)
4. No relationship.

One of the most interesting of Looney’s findings is that country A may affect arms expenditures in country B even when country B does not affect country A. Another interesting finding is that the defense expenditure of an ally can spark the same increase as the defense expenditure of an adversary, with an even shorter lag.

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Data, which Johansen (1988) discusses. Granger (1988) also points out that if military expenditure is adjusted optimally to keep output at determined target levels given exogenous shocks, there may be no observable correlation.

\(^4\)A description of the test can be found in Hsiao (1979).
Unfortunately, the variables included in the Looney approach are limited to defense expenditures, so that such factors as resource availability or economic growth are ignored. Arms race models that incorporate economic aspects in their formulation are more interesting for our purposes. The model presented by Wolfson and Shabahang (1991), for example, addresses the question, “What patterns of economic development will cause an acceleration of an arms race and increase the dangers of war?” Wolfson and Shabahang construct a model of international economic-military equilibrium and then subject it to destabilizing economic growth patterns. Because it allows researchers to address the issue of asymmetric economic growth patterns between adversaries, their model is richer than those that employ simple defense expenditure reaction equations. Tested against the experience of the Anglo-German arms race prior to World War I, their model confirms the widely held belief that rapid growth, a high level of savings, and rapid technological progress in Germany prior to World War I prompted Britain to devote increased resources to defense right up until the two countries declared war on each other in 1914.

CONCLUSION

An important lesson from the statistical literature on the military expenditures–growth relationship is that it is difficult to generalize empirically across countries. A number of country- and time-specific variables can influence how much a state decides to spend on defense. In addition, problems of data availability and measurement contribute to the difficulty of identifying generic patterns, particularly where developing countries are concerned. Some of the empirical differences between models, therefore, may be simply explained by differences in researchers’ choice of time period, country grouping, data averaging methodology, and level of data aggregation.

Further, although some models incorporate such political variables as the type of government regime and social structure, other politico-economic, sociocultural, and historical characteristics may influence the relationship between military spending and economic growth and are more difficult to capture. For some states, for example, the ability to provide a credible national defense may substitute for the procurement of other social needs as the root of national support
and legitimacy. For others, a history of external conflicts stemming from geostrategic, ideological, religious, ethnic, or other considerations may cause them to place a priority on defense that is very hard to accommodate in statistical models.

Ideally, we would like to have been able to include the various economic, politico-economic, and sociocultural explanatory variables that theory suggests belong in a formal empirical model of the determinants of great-power military spending. Unfortunately, for the time period we are considering, at best only rudimentary economic and political data are available. Therefore, we ask instead two much simpler questions. First, how much of the variation in national military expenditures over time appears to be explained by movements in national output? Second, what is the direction of influence? Our results, and the caveats that attend them, are reported in the next chapter.