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DEFENSE EXPENDITURES AND BUDGETARY PATTERNS IN SELECTED MIDDLE EASTERN AND MEDITERRANEAN COUNTRIES: AN ASSESSMENT

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ABSTRACT. This paper examines the relationship between defense spending and budgetary allocations to various programs for twelve Middle Eastern and North African/Mediterranean countries in an attempt to see if spending patterns vary systematically with changes (both anticipated and unanticipated) in the budget deficit or defense expenditures. Detailed results are presented for Syria and Oman although general patterns are discussed for all countries. Not surprisingly, we found that budget tradeoffs are complex and reflect different priorities across countries. Increases in deficits can either offset or reinforce changes in defense spending. Defense and socio-economic tradeoffs vary considerably depending on whether the country spends relatively a lot or little on defense. We conclude that there are probably some long-run costs associated with sample countries cutting growth intensive programs to accommodate defense.

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INTRODUCTION

In the aftermath of the Kuwait conflict, defense spending in many Middle East and Mediterranean countries is likely to grow despite serious fiscal problems and urgent social and economic difficulties. Depending on its relative impact, reallocations of resources to defense may significantly affect economic performance and democratization efforts in these countries. The purpose of this study is to examine the historical relationship between defense spending and budgetary allocations in twelve Middle Eastern and North African/Mediterranean countries: Malta, Cyprus, Morocco, Tunisia, Egypt, Syria, Jordan, Israel, Bahrain, Iran, Pakistan, and Oman.

Many of these countries have recently been forced to introduce austerity programs. Despite its importance, little is known how these governments set priorities between major expenditure categories as revenues shrink. For example, do expenditures on certain programs vary systematically with changes (both anticipated and unanticipated) in the budgetary deficit or defense expenditures? If such a relationship exists, is there any consistency between which sectors gained and which sectors lost? Do expenditure patterns provide insight as to the manner in which various governments established budgetary priorities?

REVIEW OF THE LITERATURE

At first glance, budgetary tradeoffs between defense on the one hand and socio/economic programs on the other hand seems fairly straightforward: increases in military expenditures, *ceteris paribus*, will crowd out an equivalent amount in other programs according to their proportion of the total. Recent research has shown that this view of the budgetary process is simplistic and does not conform to how governments choose to prioritize expenditures (see Deger, 1985). A significant issue for many Middle East countries which face austerity programs is that anecdotal evidence suggest that officials often follow ***ad hoc*** rules for cutting programs -- cutting new programs rather than ongoing projects, favoring Ministries which are politically powerful, or reducing programs which have expanded most rapidly in the past for example (Caiden & Wildavsky, 1974). With regard to which sectors get cut back, it is often felt that some programs are relatively more

vulnerable. The defense sector is usually considered to be well protected while social sectors (health, education, rural development, etc.) are considered vulnerable. This alleged vulnerability of the social sector in developing countries is evident in several World Bank publications (see World Bank, 1981, 1983a, 1983b, and 1984).

Much of the recent literature has tried to quantify the tradeoffs between defense, education, and health -- typically the three largest programs. Heller and Cheasty (1983) examined 27 middle-income countries to see how education expenditures changed when budgets were cut between 1965 and 1978. Expecting to find that education was fairly elastic, instead they found a certain 'resilience' in education expenditures. Hicks and Kubisch (1983) isolated 32 countries where real government expenditures had declined in more than one year between 1972 and 1980. They compared real percentage changes for each sector and for total government expenditures and found that social sectors and defense were relatively protected -- declining by 5% and 8% respectively while government expenditures declined by 13%.

Using a simultaneous equation model, Deger (1985) estimated that if defense allocations were cut by 15%, education would increase by approximately 1.9% in her sample of 50 countries. Examining data for Venezuela between 1950 and 1983, Looney (1986a) concluded that defense expenditures were reduced far less than comparative declines in overall government expenditures. In another study which included other Latin American countries, Looney (1986b) found a negative tradeoff between defense and other government expenditures for one set of countries and a positive tradeoff for another group of countries. The positive tradeoff was explained as a result of either civilian governments allocating more to defense to keep themselves in power, or because large capital outlays in the military were immune to short-term cutbacks.

Harris, Kelly and Pranowo (1988) tested for a tradeoff between defense and education or health. The results for 1983 suggested that high defense expenditures did not mean concomitant low health/education expenditures. In addition, defense, health and education are all vulnerable during overall cuts in government expenditures. In times of government expansion, defense and education expand at a comparative

rate in low income countries. In middle income countries, health expands relatively more than defense and education.

Using data for 1982 and 1983, Hess and Mullman (1988) examined the determinants of defense and also the tradeoff between defense and education. They found no substitution between the military and public education. De Masi and Lorie (1989) examined tradeoffs when the budgets expand and also contract under IF-supported programs in developing countries. Under fiscal-tightening the proportion of defense expenditures to GDP decreased, but defense expenditures to total government expenditures increased. Under fiscal accommodation by the IMF, resources allocated to defense declined as total expenditures grew.

Examining 51 countries between 1975 and 1987, Hewitt (1991) concluded that central government expenditures as a proportion of GDP rose to accommodate increases in interest costs. However, defense and economic services were cut by 23% and 17% respectively. Harris and Kusi (1992) found that defense expenditures in the African countries involved with the IMF stabilization programs were relatively more vulnerable than in those countries not in the stabilization program.

A recent examination of Saudi Arabian budgetary priorities (Looney, 1992) found that defense expenditures are very complementary to human resource allocations including health. The major tradeoffs involving defense were concentrated in transportation and communication and economic resource development. An examination of budgetary tradeoffs in Pakistan (Frederiksen & Looney, 1995) suggested economic services were adversely affected by defense spending and overall government debt. However they were not affected by the government's budgetary deficit position.

It thus appears that governments consider a wide range of factors --including political and economic costs, present versus future consumption and the potential impact on employment and welfare-- when faced with reducing public expenditures. Across-the-board reductions in expenditures seem to be rare for developing countries facing austerity programs. More often than not, capital expenditures are reduced more than current expenditures. Social and administrative/ defense sectors seem to be well protected while infrastructure and similar programs absorb disproportional larger reductions.

BUDGETARY TRADEOFFS -- EMPIRICAL RESULTS

The four commonly used measures of relative defense effort -- defense as a share of (a) Gross National Product (GNP) and (b) central government expenditures, (c) armed forces per capita, and (d) arms imports as a percentage of total imports is useful as a way to roughly divide developing countries into two broad groups of high and low defense spenders. However the classification is all too often ambiguous: some countries may indicate low defense shares of GNP on the one hand but large allocations of the central budget on the other hand. As recently indicated (Frederiksen & Looney, forthcoming) a factor analysis (using data from 1972 to 1989) incorporating these four variables and twenty-one other related variables provided an unambiguous ranking of countries in terms of defense patterns. A discriminant analysis confirmed the correct classification of countries of countries into either the high or low defense group. This recent study indicated Egypt, Syria, Jordan, Morocco, Pakistan and Israel were relatively highly militarized, and Iran, Malta, Oman, Tunisia, Cyprus, and Bahrain relatively less militarized.

To examine changes in various government programs in the face of budgetary changes or changes in defense, the following model was estimated in linear form:

$$SHARE_{i,t} = aDFTEX_t + bDFTUN + cMILUN_t + dMILEX_t + \in \quad (1)$$

where $SHARE_{i,t}$ represents the proportion of the government budget allocated to the ith program in year t,
DFTEX is the expected government deficit or surplus,
DFTUN is the unexpected (transitory) deficit or surplus,
MILUN is the unexpected expenditures,
MILEX is expected defense expenditures, and
$\in$ is the error term with the traditional statistical assumptions.

All variables are expressed as a share of the central government expenditures. Expected values of the deficit and military variable in time period t is based on the trend of past levels. Unexpected values are the difference between actual and expected values. The military variable is included to represent the guns versus butter analogy. While the SHARE variable might be influenced by resources allocated to programs other than defense, the military budget is usually the most significant variable affecting sector allocations.

Equation (1) assumes that the expected deficit reflects a structural imbalance between revenues and expenditures. Transitory deficits (the component of the deficit not anticipated) may occur because of a revenue shortfall. In this case the expected deficit could be met by cutting expenditures accordingly. If an unanticipated deficit occurs, we assume this reflects a decision to fund priority sectors. If a program's share falls as the unanticipated deficit increases, we assume this reflects a decision to support programs with a higher priority. This form of prioritizing is consistent with some form of lexicographic ordering of budgetary priorities where the government tries to maintain certain pre-defined levels. As these levels are met, authorities are willing to increase funding for categories and programs of lower priority. The expected and unexpected military expenditure terms can be interpreted in a similar manner.

We present detailed results for two representative countries: Syria, a high defense country, and for Oman, a low defense country.[1] Each country exhibits many of the patterns found in other member countries of their respective group. Two sets of the model were estimated for each country: Equation (1) was estimated to reflect short-run budgetary adjustments to changes in the deficit and defense expenditures. A second set of equations were estimated by including the lagged value of the dependent variable (LAG) as an additional independent variable. This form examines the long-run budgetary adjustments to year-to-year changes in the deficit position and military shares. The longer term adjustments were assumed to follow a distributed lag function (Koyck, 1954).

The results of the short-run impact model and longer run adjustment model for Syria appear as Table 1. In the short-run, the results suggest that the Syrian government tends to use budget deficits as a means of tempering the impact of expanded defense programs on social programs. Rising defense expenditures (both expected and unexpected) and budgetary deficits expand to increase the provision of public services, housing and community activities. To varying degrees the budgetary shares of these categories are stabilized through expanded fiscal deficits. On the other hand, the defense expenditure stimulus to health and education is dampened by the overall budgetary effect.

TABLE 1
Syria, Short Run Impacts and Longer Run Adjustments, 1972-1987, t-statistics

	Short Run Impacts					
SECTOR	DFTEX	DFTUN	MILUN	MILEX	R^2	DW
Public Services	-4.25***		-5.45***	-1.97*	.81	1.5
Education	6.00***		4.70***	4.65***	.70	3.2
Health	3.41***	2.79**	2.73**	1.62	.84	2.5
Social Security, Welfare	-8.01***		-8.00***	-1.11	.89	1.7
Housing, Community Activities	-4.66***		-2.43**	-1.77	.67	1.7
Mining, Manufacturing, Construction	1.88*	2.17*	-4.35***	-6.60***	.88	2.7
Energy	-2.86**		-3.85***	-3.13**	.51	1.6
Transportation, Communication	-1.38		-2.49**	-1.66	.31	2.1

	Long Run Adjustments					
	LAG	DFTEX	DFTUN	MILUN	MILEX	R^2
Public Services	5.34***	- 1.90*		- 0.82	-1.43	.70
Education	0.93	5.73***		4.30***	4.52***	.69
Health	5.43***	1.43		1.56	2.20*	.74
Social Security, Welfare	4.87***	-12.13***		-15.24***	1.09	.95
Housing, Community Activities	5.60***	- 3.30***		- 0.94	-3.15**	.71
Mining, Manufacturing, Construction	2.80**		1.46	- 1.97*	-2.04*	.83

Note: *** , **, and * indicate statistical significance of the estimated coefficients at the 99%, 95% and 90% level of confidence, respectively.

Economic services present more of a mixed pattern. Increases in defense occur at the expense of (a) mining, manufacturing, and construction, (b) energy, and (c) transportation and communication. The resulting decline in budgetary shares is reinforced through the fiscal deficit. On the other hand, the Syrian government appears willing to run higher deficits for the purpose of stabilizing allocations to energy and transportation/communication.

Many of these patterns appear similar, but weaker, in the longer term. While defense budgetary shares expand at the expense of social security, housing community amenities and economic services, only in the case of social security and housing does the government seem willing to expand the deficit to maintain programs. In the long-run, increased education and health expenditures expand with defense. While the government continues to use budget deficits to offset this effect on education, health appears unaffected by movements in the fiscal deficit.

The results for Oman, a member of the low defense group, appear as Table 2. Many of the patterns apparent in Syria seem to be reversed. For example, in the short-run, increased defense usually comes at the expense of social services such as education, health and housing. However, expanded defense shares tend to be associated with expanded allocations to economic activities such as mining, manufacturing, construction and communication. In contrast to Syria, the Oman government appears to confine its use of deficits to housing, mining, manufacturing and construction in order to offset these defense impacts.

In the longer run, defense expenditures do not affect health or education expenditures with the former being supported by larger deficits. Allocations to housing appear vulnerable in the long-run to expanded defense shares. This effect is reinforced through budgetary cuts during times of expanded deficits. Economic services appear complementary to defense expenditures. For roads, this pattern is reinforced through expanded allocations which, in turn, are associated with growing fiscal deficits.

TABLE 2
Oman, Short Run Impacts and Longer Run Adjustments, 1972-1989, t-statistics

Short Run Impacts

SECTOR	DFTEX	DFTUN	MILUN	MILEX	R^2	DW
Education	- 0.57		-1.58	-1.86*	.91	2.2
Health		-1.40	-3.30***	-2.65**	.79	2.6
Housing, Community Activities		-2.47**	-3.43***	-1.64	.72	1.9
Mining, Manufacturing, Construction	-2.38**	-3.49***	2.05*	2.87**	.39	2.5
Communications	-0.99		1.89*	3.57***	.53	2.2
Other Expenditures		0.74	-2.78**	-3.60***	.72	1.6

Long Run Adjustments

	LAG	DFTEX	MILUN	MILEX	R^2
Education	9.60***	0.16	-0.24	0.26	.89
Health	4.43***	-3.79***	0.64	1.08	.88
Housing, Community Activities	3.81***	3.69***	-4.25***	-2.56**	.78
Economic Services	2.69**	-1.63	0.90	3.41***	.65
Roads	3.89***	-2.53**	0.96	1.58	.48
Communications	5.03***	0.85	-0.31	2.99**	.54

Note: *** , **, and * indicate statistical significance of the estimated coefficients at the 99%, 95% and 90% level of confidence, respectively.

PATTERNS OF SHORT AND LONG RUN IMPACTS

While we have only presented results for Syria and Oman, we can summarize the patterns of (a) short-run and (b) long-run budgetary impacts for both the high defense and low defense groups with respect to the different expenditure sectors. Because of the diversity of the sample group, not surprisingly no consistent pattern emerges. In the short-run, public services seem to have a fairly high priority in only the high defense group. For all of the high defense group except Israel, increases in the expected deficit funded expanded levels of public services. Expanded defense shares (especially unanticipated increases) support public services in this group. Public services in the low defense group (with the exception of Malta) are not affected one way or another with changing deficit or defense shares.

Education presents an interesting contrast. In the high defense group, education allocations increase with expanded expected defense shares, although several countries reduce the share to education with unexpected increases in defense -- a pattern duplicated in the low defense group. Health expenditures seems to be the major casualty of expected deficits in the high defense group although in several cases this is offset by increased defense expenditures. Health does not suffer in the low defense group as a result of budgetary strategies but is an area likely to be cut by increases in defense.

Housing and community activities receive considerable budgetary support in both groups, especially in the case of unexpected deficits in the low defense group. Budget shares in housing suffer by changes in defense but with no appreciable difference between the groups. Economic services provide interesting contrasts since allocations are invariably cut as defense expands in the high defense group. However, several countries, for example Israel and Pakistan, increase economic services as the deficit increases although this effect may be offset by changes in the defense share and unexpected deficits. Economic services do considerably better in the low defense group, with many countries expanding this sector as deficits or military expenditures increase.

Roughly the same patten emerges over the long-run. Public services benefit from increased deficits in many of the countries in both groups. The concomitant expansion with military expenditures in the

short-run does not carry over into the long-run however. The negative impacts on health in the low defense group from increases in military expenditures largely disappears in the long-run. They still occur in Pakistan and several of the low defense countries.

Social security and welfare programs seems to be more vulnerable in the long-run to budget cuts in the high defense group. Increases in the unintended defense spending reduces allocations to these programs. Economic services still appear vulnerable to unexpected increases in military spending in the high defense group. However, several of the low defense countries no longer expand economic services with increases in the deficit.

SUMMARY AND CONCLUSIONS

There are four main findings of this study. First, defense budgetary tradeoffs for our sample set of countries (and we suspect for all Third World countries) are complex, reflecting different priorities across countries. Reinforcing this is that increases in deficits can either offset or reinforce the defense impacts. Second, defense and socio-economic tradeoffs vary considerably, depending primarily on whether the country is a high or low defense spender.

Third, several of the high defense countries appear to cut economic expenditures to free up resources for further expansions in the military. The high political costs involved in cutting the military share may explain this phenomenon. With several exceptions, the low defense spending group seem to have a little more flexibility in accommodating increased levels of military expenditures. Perhaps as a result economic programs are not as susceptible to cuts in these countries.

Fourth, there are probably long-run costs associated with the manner in which our sample group alters budgetary shares to accommodate larger defense budgets. While larger defense budgets in the high defense group may have helped economic growth in earlier decades, the emerging evidence in the literature indicates that the impact will be negative in the 1980s and 1990s and may well indicate a neglect of economic services, infrastructure programs and the like. However, given the lagged nature of defense impacts, a reorientation of budgetary

priorities may be reflected in economic growth for at least another decade.

NOTES

1. Results for the entire sample group of countries can be obtained from the authors on request.

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