11 The impact of military expenditures on human-capital development in the Arab Gulf States

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INTRODUCTION

It is often argued (Cummings, *et al.* 1980, 38–49) that the post-1973/4 expansion in military expenditures undertaken by the Persian Gulf States has led to competition between the military and civilian sectors for skilled labor. Furthermore, military expenditures are said to have preempted funds that might have otherwise been allocated to education and the improvement of human capital. As a result, it is argued, military expenditures in the region tended to frustrate the oil exporters' ambitious economic-development programs, especially those of the less-populated oil-exporting countries.

Another view originally presented by Stephanie Neuman (1978) in her analysis of the pre-Revolutionary Iranian situation is that some of the skills taught by the military can benefit the civilian sector. As she (Neuman 1978, 589) points out, however, a question still remains as to:

> how one would distinguish between the military and the civilian costs and benefits. What is the net balance over the long and short term? Furthermore, how are the skill levels related to the kinds of military technology imported? Does more technology demand higher skills and, therefore, indirectly upgrade the educational level of the country? Instead, does it draw away needed skilled manpower from the civilian sector?

Clearly, the ability of these countries to adapt to changing and, in most cases, more austere economic environments will depend in large part on how effectively they take advantage of the years of abundant revenue to increase the education and skills of their domestic workforces.

The purpose of this chapter is to address whether military expenditures in the Arab world in general, and the Gulf States in particular have come at the expense of national human-resource development. Based on this

analysis several implications are drawn as to the development of human capital in the Gulf States.

MANPOWER SHORTAGES AND GOVERNMENT EXPENDITURES

Human-capital accumulation can be stimulated in developing countries through public education expenditure, as well as government spending on health and other social services. Clearly, governments are by far the most important agencies in this area and can do much more than private enterprises could ever hope to achieve.

Government initiative in this area has expanded in recent years, with Arab countries as a whole increasing their educational expenditures as a percentage of GNP from 3.87 (1974) to 5.08 (1984, see Table 11.1). The corresponding figures for non-Arab countries were 3.33 percent and 4.01 percent. Health expenditures have not shown such a dramatic increase, however, rising from 1.39 percent of GNP (1974) for the Arab countries to 1.59 (1984). A similar pattern was observed in the non-Arab countries. Here, health expenditure increased from 1.32 to 1.62 percent of GNP during the same period.

On the other hand, the governments of developing countries also have made extremely strong commitments to military expenditure in order to bolster security and counter threats. Aggregate defense expenditure is almost always state-induced, and the consumption of scarce resources to support the military as well as reallocation of valuable inputs into arms production must generally be provided for in national budget. In terms of general magnitudes, Arab countries expanded their military expenditures as a share of GNP from 7.87 percent (1974) to 12.39 percent (1984). Militarization in the non-Arab countries was not nearly as dramatic, with defense expenditures increasing from 3.01 to 3.72 percent of GNP over the corresponding time period.

In short, concurrent with rapid economic growth in the Arab world, there has been an acceleration in military spending. For the region as a whole, military purchases have been partially financed by oil revenues and by military aid and grants from the major arms suppliers. Lebovic and Ishaq (1987, 107) have noted that while the absolute regional military spending has been phenomenal, the military has also controlled a greater percentage of the central government budget in the Middle East and twice as much of the national output as in other developing countries or in the world as a whole:

> Middle Eastern defense accounted for one-third of the military spending of developing countries and almost one-half of world arms imports. During the 1973–1982 period, the average annual economic growth rate for individual Middle Eastern states was about 6.0%, while military expenditures grew by approximately 13.0% per year. Although military expenditure levels vary greatly across countries, in a great majority of

Table 11.1 Contrasts in human-resource and military expenditures: Arab and non-Arab countries, 1974–84 (means)

Variable	Arab countries	Sample size	Non-Arab countries	Sample size
Military expenditures (percentage of GNP)				
1974	7.87	20	3.01	74
1979	10.54	19	3.37	80
1984	12.39	20	3.72	84
($ per capita)				
1974	139.82	20	32.50	74
1979	559.74	20	58.21	80
1984	539.31	20	75.64	84
Educational expenditures (percentage of GNP)				
1974	3.87	20	3.33	80
1979	4.81	19	4.01	84
1984	5.08	20	4.01	85
($ per capita)				
1974	83.98	20	20.54	80
1979	270.81	18	52.96	84
1984	221.37	18	64.37	85
Health Expenditures (percentage of GNP)				
1974	1.39	20	1.32	80
1979	1.35	18	1.64	82
1984	1.59	18	1.62	85
($ per capita)				
1974	33.06	20	9.07	80
1979	64.65	18	23.14	82
1984	96.13	18	27.05	85

Source: Ruth Leger Sivard (various years).

the countries the growth rate of military spending outpaced economic growth. This indicates a striking trend in the region toward higher military burdens.

As Lebovic and Ishaq (1987, 107) point out, besides the simple guns-versus-butter tradeoff, economic theory does not unambiguously indicate whether a higher military burden retards or promotes economic growth. Empirical evidence on the subject has become the focus of considerable controversy.

Again, as Charles Wolf (1981, 89) has noted:

> Military and paramilitary forces can contribute to economic development by their contributions to internal and external stability. Moreover, the real economic costs imposed by the military on developing countries can be reduced to the extent these forces provide training, construction, technological and industrial spill-overs that contribute to economic

growth. Evidence in support of both of these propositions is provided by the experience of several of the successfully modernizing countries during the past decade.

In a more recent study, Weede (1983, 17) finds considerable empirical support for the proposition that increased military-participation rates increase overall economic growth:

> In my view, the positive effect of military service on economic performance should be explained as follows: the military teaches discipline and creates a useful habit of obeying orders. Where the military participation ratios are high, the military is more likely to be disciplined and effective than elsewhere, since there is a perceived need to be on the alert against foreign enemies. Moreover, the higher the military participation ratio, the more young men acquire discipline and obedience. That is why I regard the military participation ratio as a discipline related indicator of human capital formation, why I suggest to broaden the notion of human capital formation so as to include abilities and discipline.

Clearly, the Arab World, given its relatively low levels of human-capital formation, should be one of the areas most receptive to this link between military expenditure, military participation, human-capital formation, and economic growth. However, in their study of the relationship between defense burdens and growth in the Middle East, Lebovic and Ishaq (1987) find in general the relationship was negative for the non-oil-exporting countries, but that no statistically significant pattern existed for the total sample (seventeen countries). The negative finding is consistent with those obtained by Frederiksen and Looney (1983) who make a distinction between resource-constrained and resource-abundant countries.

Given the small sample sizes of oil producers in the Middle East, Lebovic and Ishaq were not able to test for any potential positive relationships between defense expenditures and economic growth, a relationship identified by Frederiksen and Looney for larger samples of developing countries. These positive relationships have, however, been identified through time-series analysis for certain individual countries and periods of time.

For example, in the case of Saudi Arabia it was found that (Looney 1987, 225–6):

1. In general, military expenditures have had a net positive impact on the country's overall gross capital formation. That is after controlling for government expenditures and oil revenues, increases in military expenditures have had a net stimulating effect on investment in the Kingdom. The same also applies to non-oil investment. Here, however, the strength of defense expenditures was low compared with that of government investment.
2. Military expenditures do not appear to stimulate either total private-sector expenditures or consumption. Again government investment

appears particularly productive in contributing to increased levels of private-sector consumption.

3 Military expenditures do not appear to increase levels of imports nearly as much as do the overall levels of government expenditures or oil revenues.

4 Interestingly enough, military expenditures appear to induce private-sector investment whereas government investment seems to crowd out or preempt resources that might otherwise flow toward this sector.

5 In the net, military expenditures appear to contribute more to overall demand than does government consumption. The stimulating effect of military expenditures on other types of government expenditures tended to reinforce this effect.

In short, military expenditures in the Saudi Arabian context appear to have (in addition to their security value) a number of significant impacts on the private sector, not all of which are negative. In particular, several of the major areas of private-sector activity appear to derive more of a stimulus from government expenditures than from other forms of government allocations. The same also appears to apply to the overall level of gross capital formation and non-oil investment.

In addition, these results suggest that a careful shifting of government allocations from public-sector consumption to capital formation (providing that profitable areas for investment have not been exhausted) rather than across-the-board reductions in military expenditures is the most productive policy open to the authorities for contributing to private-sector expansion.

In a slightly different context, it has been suggested that excessive defense expenditures led to the economic instability preceding the Iranian Revolution. While this argument sounds quite plausible, recent cross-sectional research has reached the counterintuitive conclusion that Iran may have actually derived a number of beneficial economic impacts from allocations to the military. However, cross-sectional analysis only looks at one point in time, and hence its results are always sensitive to the dates chosen for examination.

To determine if longitudinal analysis provides a different perspective on the impact of the country's military expenditures, another time-series study (Looney, 1988) attempted to quantify the impacts of military expenditures on the Iranian economy over the 1959–77 period, and in particular the consequences associated with the rapid military buildup undertaken by the Shah in the mid-1970s.

In general, the main findings of this study indicated that while a case could be made that the Iranian economy received positive net benefits from defense expenditures in the 1960s, this relationship broke down in the 1970s, with added military expenditures, perhaps through the bottlenecks they created, having a negative impact on a number of sectors and types

of capital formation. Interestingly enough, these negative effects were not systematically associated with other types ot government expenditures, indicating that defense expenditures were unique in their marginal negative impact on private-sector output after the 1973–4 revenue boom.

Again these findings are consistent with cross-sectional analysis which indicates that resource-constrained countries generally experience negative impacts from military expenditures while those not constrained by foreign exchange and/or domestic savings are capable of experiencing positive impacts from increased allocations to defense.

Looking at the impact of military expenditures from a different perspective, that of labor scarcity, Cummings *et al.* (1980) note that the labor shortages in the Gulf States created by expanded military expenditures may be a far greater long-term impediment to growth in the region than any effects associated with the diversion of capital or foreign exchange to military activities. In a somewhat similar manner, Mousad (1984) found that a 10 percent reduction in the military-spending ratio (percentage of GNP) or a decrease of around $12.9 billion would increase education expenditure by around $8.1 billion per year.

Along these lines, Deger (1984, 42–3) estimated that a 15 percent reduction in the military-spending ratio, that is from 6.3 percent of GDP to 5.4 percent (approximately $13 billion in absolute terms), would increase the education-expenditure ratio to 2.93 percent of national output. In absolute terms this would amount to about $4.5 billion a year. These estimates were made for developing countries as a whole, with no distinction made between countries as being resource-abundant or resource-constrained, labor-abundant or labor-scarce, and so on.

The purpose of this chapter is to extend several strands of the analysis surveyed above. Specifically, we are primarily interested in examining the Arab states, a set of countries characterized as generally having by Third World standards very high military burdens (military expenditures as a percentage of GNP) together with lower-than-average levels of human capital. In addition, we are interested in determining whether and to what extent military expenditures act independently of total government expenditures in affecting human-capital development in the region. Finally, are the linkages between military expenditures and human-capital development fundamentally different in the Arab states from those experienced in other parts of the world? If so, why?

FRAMEWORK FOR ANALYSIS

The main measurable variables pertain to allocations to defense, government expenditures, and public education that may generate human capital. The latter is proxied by the ratio of public education expenditure as a proportion of GDP. Following Deger (1985, 42–3), we assume that public-education spending as a proportion of the national product is a crucial

determinant of human-capital formation (*HC*). In other words, if this ratio falls, the rate of growth of human capital will, in all probability, also fall.

As Lebovic and Ishaq (1987, 110) have noted, one of the main difficulties with previous studies was their lack of clarity as to whether the military burden acted in some way as a statistical proxy for government expenditures. To avoid this problem, total government expenditures were included in the analysis in addition to military expenditures, with each defined in terms of a different ratio. Specifically, government expenditures (*GEY*) were treated in terms of their share of GNP.

To avoid spurious correlations with government expenditures, allocations to defense were defined in ways other than the traditional military burden (military expenditures as a share of GNP). Since the literature is unclear as to the most appropriate manner to define the defense burden, three alternative measures were used: (a) military expenditures per soldier (*MEAF*), (b) the defense share of the central-government budget (*MEGE*), and (c) the military-participation rate, the number of soldiers per 1000 population (*AFP*).

Increases in human-capital formation over any time period are likely to be affected by the initial level of human-capital resources. That is, countries beginning with a relatively low level of human-capital development are more likely to experience rapid increases. To control for this factor, the rate of human-capital development at the beginning of the period (that is, *HC74* for the 1974–84 interval) was introduced into the regression equation.

Finally, increases in per capita income may expand the demand for education. This is the so-called Wagner's Law, (Whynes 1979, ch. 2) which also implies an increase in defense share of the government budget at higher levels of per capita income. To control for this factor, the increase in per capita income (*YP*) was also introduced into the regression equations.

In sum, the model with expected signs used for examining the impact of military expenditures on human-resource development was of the form:

$$\underset{(+)}{HC} = [\underset{(+)}{GEY}, \underset{(?)}{MEAF}, \underset{(?)}{MEGE}, \underset{(?)}{AFP}, \underset{(+)}{YP}, \underset{(-)}{HC0}, \underset{(+)}{GEY74}]$$

where:

HC	=	educational expenditures/GNP
GEY	=	total government expenditures/GNP
MEAF	=	military expenditures per soldier
MEGE	=	the share of defense in the central-government budget
AFP	=	the number of soldiers per 1000 population
YP	=	per capita income (GNP/population)
HC0	=	educational expenditures/GNP in the base year
GEY74	=	total government expenditures/GNP in the base year

Data were taken from Sivard (various years). The original sample of developing countries consisted of 109 nations. Because of missing observations on several countries, the usual sample size was around ninety countries. The Arab countries are defined as those nations where the majority of the population is Arab. The presumption here is that these countries share a common set of social institutions and cultural values. These, in turn, influence the manner in which resources are allocated to the military and socioeconomic programs.

The Arab countries are all members of the Arab Monetary Fund, and consist of: Jordan, the United Arab Emirates (UAE), Bahrain, Tunisia, Algeria, Saudi Arabia, Sudan, Syria, Somalia, Iraq, Oman, Qatar, Kuwait, Lebanon, Libya, Egypt, Morocco, Mauritania, Yemen Arab Republic, and the People's Democratic Republic of Yemen. Again because of missing observations, Lebanon, Qatar, and Mauritania were absent from most of the regressions.

All variables except *HCO* and *GEY74* were defined in terms of their rate of growth over the period under consideration. To get an idea of the robustness of the results, stepwise regressions were undertaken for the entire time interval 1974–84, together with its two five-year subperiods, 1974–9 and 1979–84.

RESULTS

The results for the period as a whole (1974–84) produced several interesting findings (Table 11.2):

(a) For developing countries, in general, the estimated model (Equation 1 in Table 11.2) explained approximately 70 percent of the changes in human-capital formation. The coefficient for the government-expenditure term (*GEY*) was very stable, not changing appreciably with varying model specification.

(b) While increased military expenditures per soldier (*MEAF*) did not detract from human-capital development, other measures of military expenditures did. In particular, increases in the defense share of the public-sector budget (*MEGE*) tended to reduce human-capital development during this period. The same was also the case for increase in the military-participation rate (*AFP*).

(c) In terms of individual Gulf States, it appears that several countries (Iraq and Saudi Arabia) had increases in human-capital formation considerably below that predicted by the model (Equation 2 in Table 11.2), while Iran and Oman had rates of human-capital formation considerably above that anticipated by the model.

Looking at countries in terms of Arab/non-Arab classifications (Equations 2 and 3 in Table 11.2), however, produces a considerably different picture of the factors at work affecting human-capital formation:

Table 11.2 Factors affecting human-capital formation in the Third World, 1974–84 (standardized regression coefficients)

Third World countries – total sample

(1) $HC = 0.84\,GEY - 0.11\,MEAF - 0.17\,MEGE - 0.13\,GEY74$
(10.36) (−1.16) (−2.31) (−1.890)

$+0.10\,YP - 0.20\,AFP$
(1.37) (−2.62) r2 = 0.697; F = 31.12; df = 87

Country	Residual	Standard error	Student residual	Cooks'D
Bahrain	−0.08	0.68	0.33	0.001
Iraq	−3.12	0.62	−5.05	0.883
Kuwait	−0.27	0.68	−0.41	0.001
Oman	1.39	0.67	2.08	0.037
Qatar	n.a.	n.a.	n.a.	n.a.
Saudi Arabia	−1.14	0.66	−1.73	0.033
UAE	0.00	0.67	0.01	0.000

Arab countries

(2) $HC = -0.26\,GEY + 1.74\,MEAF - 0.49\,MEGE - 0.26\,GEY74$
(0.02) (5.03) (−3.19) (−2.76)

$-0.90\ YP + 0.42\ AFP$
(−3.13) (2.15) r2 = 0.942; F = 30.21; df = 17

Country	Residual	Standard error	Student residual	Cooks'D
Bahrain	0.49	0.55	0.89	0.068
Iraq	−0.45	0.35	−1.28	0.716
Kuwait	−0.35	0.60	−0.59	0.017
Oman	0.41	0.53	0.77	0.061
Qatar	n.a.	n.a.	n.a.	n.a.
Saudi Arabia	−1.26	0.63	−2.03	0.139
UAE	−0.07	0.56	−0.13	0.001

Non-Arab countries

(3) $HC = 0.87\ GEY - 0.34\ MEAF - 0.21\ MEGE - 0.16\ GEY74$
(8.89) (−3.27) (−2.41) (−2.00)

$+ 0.06\ YP - 0.23\ AFP$
(0.69) (−2.52) R^2 = 0.942; F = 30.21; df= 70

Note: R^2 = *the coefficient of determination;* F = the F statistic; df = the degrees of freedom; ( ) = the t statistic.

(a) While by itself the share of government expenditures in GNP accounts for well over 65 percent of the observed fluctuations in human-capital formation in the Arab World, this relationship breaks down with more complete model specification. In the completely specified model (Equation 2, Table 11.2) increases in the government-expenditure share of GNP are no longer significant in affecting the pace of human-capital formation.

(b) Perhaps more important, several of the military-expenditure terms are now statistically significant. Both expanded rates, military expenditures per soldier (*MEAF*) and the military-participation rate (*AFP*), tended to increase human-capital development during this time period.

Table 11.3 Factors affecting human-capital formation in the Third World, 1974–9 (standardized regression coefficients)

Third World countries – total sample

(1) $HC = 0.58\,GEY + 0.50\,MEAF - 0.53\,MEGE - 0.20\,GEY74$
(7.39) (2.56) (−6.12) (−2.91)
$-0.51\,YP + 0.10\,AFP$
(−2.82) (1.37) $R^2 = 0.679$; $F = 28.18$; df = 86

Country	Residual	Standard error	Student residual	Cooks'*D*
Bahrain	0.21	0.35	0.59	0.009
Iraq	−0.09	0.37	−0.24	0.000
Kuwait	−0.22	0.37	−0.60	0.001
Oman	0.74	0.37	2.04	0.035
Qatar	n.a.	n.a.	n.a.	n.a.
Saudi Arabia	−0.80	0.35	−2.26	0.094
UAE	−0.21	0.36	−0.58	0.003

Arab countries

(2) $HC = 0.37\,GEY + 1.09\,MEAF - 0.53\,MEGE - 0.41\,GEY74$
(2.37) (2.96) (−4.22) (−3.60)
$-0.90\,YP$
(−2.67) $R^2 = 0.868$; $F = 15.83$; df = 17

Country	Residual	Standard error	Student residual	Cooks'*D*
Bahrain	0.22	0.23	1.01	0.292
Iraq	−0.22	0.35	−0.62	0.008
Kuwait	−0.53	0.34	−1.52	0.065
Oman	0.31	0.30	1.01	0.083
Qatar	n.a.	n.a.	n.a.	n.a.
Saudi Arabia	−0.76	0.32	−2.42	0.385
UAE	−0.02	0.33	−0.06	0.000

Non-Arab countries

(3) $HC = 0.59\,GEY + 0.32\,MEAF - 0.41\,MEGE - 0.13\,GEY74$
(6.98) (1.57) (−5.01) (−1.71)
$-0.41\,YP + 0.14\,AFP$
(−2.11) (1.66) $R^2 = 0.648$; $F = 19.09$; df = 68

Note: R^2 = the coefficient of determination; F = the F statistic; df = the degrees of freedom; ( ) = t statistic.

However, as with the total sample, increases in the defense share of the budget (*MEGE*) tended to reduce the growth in human-capital formation.

(c) For the non-Arab countries much the reverse was true. In addition to increased levels of defense expenditures in the central-government budget, these countries as a group experienced negative effects on human-capital formation stemming from increased military expenditures per soldier and the military-participation rate.

Much the same pattern characterizes the two five-year subperiods (Tables 11.3 and 11.4):

Table 11.4 Factors affecting human-capital formation in the World, 1979–84 (standardized regression coefficients)

Third World countries – total sample

(1) $HC = 0.47\,GEY - 0.14\,MEAF - 0.28\,MEGE - 0.18\,GEY74$
(4.58) (−1.37) (−2.79) (−1.92)
$+0.14\,YP + 0.04\,AFP$
(1.49) (0.39) $R^2 = 0.331$; $F = 7.09$; df = 92

Country	Residual	Standard error	Student residual	Cooks'*D*
Bahrain	−0.20	0.30	−0.68	0.005
Iraq	−1.05	0.20	−5.18	4.834
Kuwait	0.31	0.30	1.04	0.006
Oman	0.09	0.29	0.31	0.001
Qatar	n.a.	n.a.	n.a.	n.a.
Saudi Arabia	0.15	0.30	0.51	0.001
UAE	0.49	0.30	1.66	0.022

Arab countries

(2) $HC = -1.65\,GEY + 3.03\,MEAF - 2.93\,MEGE - 0.11\,GEY74$
(−2.72) (4.35) (−4.87) (−0.76)
$-1.37\,YP + 1.34\,AFP$
(−3.92) (2.55) $R^2 = 0.839$; $F = 8.71$; df = 16

Country	Residual	Standard error	Student residual	Cooks'*D*
Bahrain	−0.01	0.18	−0.07	0.000
Iraq	−0.02	0.03	−0.74	0.011
Kuwait	0.07	0.19	0.39	0.009
Oman	−0.20	0.17	−1.18	0.148
Qatar	n.a.	n.a.	n.a.	n.a.
Saudi Arabia	−0.13	0.20	−0.66	0.016
UAE	0.27	0.15	1.88	0.681

Non-Arab countries

(3) $HC = 0.74\,GEY - 0.24\,MEAF - 0.28\,MEGE - 0.11\,GEY74$
(7.59) (−2.47) (−3.00) (−1.02)
$+0.07\,YP - 0.06\,AFP$
(0.77) (−0.67) $R^2 = 0.558$; $F14.49$; df = 75

Note: R^2 = the coefficient of determination; *F* the *F* statistic; df = the degrees of freedom; ( ) = the *t* statistic.

(a) Developing countries as a whole did have a slight stimulus to human-capital formation coinciding with increased military expenditures during the first period, but this turned into a negative (albeit statistically insignificant) effect in the later (1979–84) period.

(b) Developing countries as a group had slower rates of human-capital formation when defense expenditures expanded in the government budget, but this effect was considerably weaker in the second time period as opposed to the first. Apparently, as a group these countries did not experience any retarding effect on human-capital formation resulting from increased military-participation rates.

(c) However, Arab countries were able to expand human capital in line

with increased military expenditures per soldier. This effect was fairly strong in both subperiods, and was complemented in the second time period by increased military-participation rates. In both time periods, well over 80 percent of the movements in human capital could be accounted for by the model. As with the 1974–84 time period, an increased share of government expenditures in GNP was not translated into an improvement in the rate of increase in human-capital development.

(d) In contrast, non-Arab countries found their efforts to expand human-capital development little affected by military expenditures, other than increases in the defense share of the budget. In the first time period, increased military expenditures per soldier and increased military-participation rates had a slight positive (but insignificant) effect on human-capital formation, while in the later time period both terms were negative with only military expenditure per soldier statistically significant.

CONCLUSIONS

While it might seem intuitively obvious that shifting public allocations from military toward educational activities would accelerate human-capital development and hence increase a country's long-run growth prospects (while in the case of the Gulf States reducing dependence on foreign workers), the results presented above indicate that this view is too simplistic. Admittedly, this possibility may hold some validity for many developing countries, but it does not appear to be an accurate description of the process by which resources are allocated in the Arab World. For these countries, increases in military expenditure per soldier and in the military-participation rate appear to take place simultaneously with expanded allocations to human capital.

Based on the results presented above, one can only speculate as to the mechanisms linking military expenditures and human-capital formation in the Arab World. Given shortages of skilled labor, particularly in the Gulf, governments in that region might assign a very high priority to attracting available skilled labor to the military services (Cummings *et al* 1980, 42). This could be accomplished through monetary and other incentives. However, since the skilled labor pool is so limited, the private sector might object to sharply increased competition. This is especially so in light of a dwindling number of qualified workers.

A more likely situation is one where the governments are subsidizing education of increased numbers of civilians during periods of stepped-up military expenditures with the understanding that upon completion of training those individuals will serve some time in the military. This strategy would allow the military to absorb the large volume of sophisticated weapons flowing into the region while at the same time not requiring drastic increases in the numbers of foreign military advisers.

This interpretation is consistent with the results obtained above. Given the fairly high correlation between military expenditures and government revenues in the region (Looney 1987), allocations to both defense and education could increase fairly rapidly without either category experiencing significant changes in its share of the budget. Because of the low skill levels of the local populations in these countries, it is unlikely that rapid increases in military expenditures per soldier and in the number of soldiers per capita could be absorbed without accelerated training programs both within and outside the military.

The results presented here suggest that additional analyses should be undertaken. In particular, it would be interesting to see the impact of other types of government expenditures – especially those going to administration and services. It may well turn out that these expenditures have even higher opportunity costs in terms of labor shortages and/or reduced levels of educational attainment.

REFERENCES

Cummings, John, Hossein Askari, and Michael Skinner. 1980. Military expenditures and manpower requirements in the Arabian peninsula. *Scientific American* Winter: 38–49.

Deger, Saadet. 1985. Human resources, government education expenditure, and the military burden in less developed countries. *Journal of Developing Areas* 20: 37–48.

Frederiksen, Peter and Robert Looney. 1983. Defense expenditures and economic growth in developing countries. *Armed Forces and Society*, Summer: 633–45.

Lebovic, James and Ashafaq Ishaq. 1987. Military burden, security needs, and economic growth in the Middle East. *Journal of Conflict Resolution* 31: 106–38.

Looney, Robert. 1987. The impact of defense expenditures on the Saudi Arabian private sector. *Journal of Arab Affairs*, Fall: 198–229.

Looney, Robert. 1988. The role of military expenditures in pre-Revolutionary Iran's economic decline. *Iranian Studies*: 52–71.

Mousad, Mohamed. 1984. Human resources, government education expenditures and the military burden in less developed countries: with special reference to Arab countries. *Bulletin of Arab Research and Studies*: 35–55.

Neuman, Stephanie. 1979. Security, military expenditures and socioeconomic development: reflections on Iran. *ORBIS* 22: 569–94.

Sivard, Ruth. Various years. *World Military and Social Expenditures*. Washington D.C.: World Priorities.

Weede, Erich. 1983. Military participation ratios, human capital formation, and economic growth: a cross-national analysis. *Journal of Political and Military Sociology* 11: 11–19

Whynes, David. 1979. *The Economics of Third World Military Expenditure*. Austin: University of Texas Press.

Wolf, Charles. 1981. Economic success, stability, and the old international order. *International Security* 6: 75–92.