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Abstract

We examine the determinants of demand for military expenditures in the Gulf Region (Saudi Arabia, Iran, Iraq, Kuwait, Bahrain, Qatar, UAE, and Oman) by using a partial adjustment model in a panel setting estimated with the seemingly unrelated regressions (SUR) approach. Our model takes into consideration institutional inertia as well as intercountry correlations, both observed and unobserved. In addition to economic variables, we also consider a series of strategic variables to shed light on issues such as free riding and spill in effects. Our findings based on annual data between 1980 and 2016 indicate that military expenditures are influenced by both economic and strategic factors with a high degree of heterogeneity across different countries. While some countries respond more to economic factors, others exhibit more sensitivity to strategic factors.

Keywords: GCC countries, Iran, Iraq, Demand for defense, Security web, SUR analysis.
JEL Classifications: F50, H56, O53, C30.

1 Introduction

The eight countries in the Gulf Region[1] – namely Saudi Arabia, Iran, Iraq, Kuwait, Bahrain, Qatar, UAE, and Oman – account for about 8 per cent of global military expenditures as of 2018 (SIPRI, 2019). For a relatively small region, which represents only 2 per cent of the world population and 3 per cent of global GDP (World Bank, 2019), the high military figures draw attention.

Several factors have contributed to the increased military expenditures in the Gulf Region. Middle East and North Africa (MENA) countries in general and the Gulf countries in particular have been facing military conflicts, civil uprisings, political instability, coup d'etats, and threat of terrorism for many decades. The Arab Spring, Syrian and Iraqi Wars, conflicts between Israel and Iran, the Palestinian issue, the ongoing war in Yemen, the coup d'etats in Libya and Egypt as well as various foreign military interventions all have led to an economically and politically unstable region. Furthermore, the Gulf Region countries in total possess about 50 per cent of proven oil reserves in the World (EIA, 2019a). In an era where energy is more than needed to maintain economic growth and urban life, such resources make the region prone to conflicts at an intraregional as well as global scale.

In such volatile environments, military power becomes an important tool for governments to exert control over different security threats, both internal and external. Accordingly, the military expenditures in the Gulf Region have been increasing regularly since the mid 1980s. As of 2018, three of the ten countries with the highest military burden in the world are found in this region, namely Saudi Arabia (8.8 per cent of GDP), Oman (8.2 per cent), and Kuwait (5.1 per cent) (SIPRI, 2019). For these countries, military expenditures represent a burden because they are financed out of budget surpluses which could be used for other purposes such as education, health, or infrastructure development. By diverting government resources away from productive investments, military spending can cause growth rates to decline (Dunne and Tian, 2013). Furthermore, it is striking that none of these oil rich countries with high levels of per capita income makes it to the top 30 in the Human Development Index (UNDP, 2019). This indicates that the abundant resources in these countries are not sufficiently used for investments that could potentially increase life expectancy at birth, expected

[1] The body of water located between Iran and the Arabian Peninsula has been referred to as "Persian Gulf," "Arabian Gulf, or the "Gulf of Basra" depending on one's perspective. We avoid taking sides in this naming dispute and consider this territory comprised of eight countries simply as the "Gulf Region." For a discussion of different views on this topic the reader is referred to Levinson (2011).

years of schooling, harmonized test scores, and adult survival rate.

Why the governments in the Gulf Region keep increasing military spending despite its negative effects on growth and development is a crucial question to answer. Analyzing the determinants of military expenditure in the region helps us resolve this dilemma, thereby enabling policy makers to assess how to reallocate resources toward development related goals rather than to defense.

The growing interest in the demand for military expenditures has triggered a number of studies in the defense economics literature, most of which consider the MENA countries. These include Cavatorta (2010), Ali (2012), Ali and Abdellatif (2015), Karadam *et al.* (2017), and Coutts *et al.* (2019). Interestingly, there are only a few papers with a special emphasis on the Gulf Region. Asseery (2000) examines the relation between Iranian and Gulf Council Countries' (GCC) military expenditures by employing a Granger causality analysis and finds evidence for an arms race model. Al-Hamdi (2012) investigates the determinants of military expenditures by using panel corrected standard error estimations (PCSE) and concludes that past military expenditure, conflict, and oil price affect military expenditures in this region. Al-Mawali (2015) explores the effects of different types of natural resources on military spending in the Gulf Cooperation Council (GCC) countries and shows that only oil has a significant effect on military spending. In a more recent study, Farzanegan (2018) evaluates the relation between oil rents and military spending in GCC countries and presents evidence that the effect of oil rents depends on the level of corruption. Also, Dizaji and Farzanegan (2019) examine the determinants of military expenditures in Iran and find that population, trade and the average military expenditures of Middle East countries have a positive effect on defense spending; while the sanctions towards Iran has a negative effect.

The aforementioned papers, except Al-Hamdi (2012) and Dizaji and Farzanegan (2019), focus on the role of economic or sociopolitical factors such as GDP, oil price, population and institutions; ignoring the influence of the strategic factors on military spending. However, the literature on the so called "security web hypothesis" suggests that military spending of a country is strongly influenced by the military expenditures of the ally and rival countries as well as the total military expenditures in the region (Rosh, 1988; Collier and Hoeffler, 2007; Dunne *et al.*, 2008). Hence, to analyze interactions between countries and to understand the spillover effects of military spending, the strategic dimension should also be considered. This is especially crucial in the Gulf Region due to a number of reasons:

First, strong hostilities and rivalries as well as alliances are commonplace in the neighborhood. The GCC countries often see Iran as a threat in the region and tend to adjust their level of military expenditures accordingly (Asseery, 2000; Al-Hamdi, 2012). It is also likely that the countries in the region adjust their military expenditures simultaneously due to facing similar threats such as instability and terrorism. Secondly, six countries in the Gulf Region are members of the GCC. Although GCC was established to provide cooperation in economic and cultural spheres rather than a merely mutual defense pact, the member states are committed to a defensive alliance as well (Martini *et al.*, 2016). When a few states form a military alliance, a spill in effect, i.e. the effect of the alliance's military burden on the other states' defense spending, arises. The member states either decrease their military spending and become a "free rider" or increase military spending parallel to that of the allies. These concerns for defense alliances which were previously examined in the context of NATO, should be analyzed in terms of the GCC countries as well. Thirdly, the role of the US military presence can also affect the size of the military expenditures. Acting as a security guarantor of the GCC countries, the US has an increased level of military presence in the region. This can cause some member states to reduce military expenditures and rely on the US for external support. Hence, to analyze whether or not the US military spending in the region is a complement or a substitute for these countries' military expenditures is another interesting research topic.

In this paper, we aim to contribute to the literature by proposing a partial adjustment model in a security web framework for the analysis of military expenditures in the Gulf Region. Our model provides a practical approach which takes into account real world technical and institutional rigidities, thereby allowing to estimate both short run and long run elasticities of demand for military spending. To the best of our knowledge, this is the first study calculating long run elasticities for this country group. In addition, our security web concept is comprised of multiple layers which consider the behavior of the rivals, the allies as well as the US separately for each country. This not only helps understand the ongoing rivalry between Iran and the GCC countries, especially Saudi Arabia, but also reveal whether there is complementarity or free riding behavior within the GCC. Also, taking into account the military presence of the US in the Gulf Region allows examining the spillover effects as well as the degree to which the US military expenditures are considered as a substitute or a complement by each nation. A third contribution of our paper is that we perform a seemingly unrelated regressions (SUR) approach, which allows a simultaneous analysis of the behavior of different countries by taking into account complex intercountry correlations. By using this information, which cannot be fully specified in a usual regression model and therefore manifest in the error term, the SUR analysis provides not only less biased empirical results but also substantially more efficient parameter estimates. Finally, our study makes use of annual data between 1980 and 2016 in order to provide an up to date analysis in a world of rapidly changing economic, political, and military conditions.

The rest of the paper is organized as follows: Section 2 introduces our model, explains the estimation method, and describes the data set. This is followed by Section 3, which presents and discusses the empirical results. Section 4 concludes.

2 Methodology and Data

It is suggested in the literature that, at a given time, a country has a desired level of military spending and the adjustment to this optimal level occurs only gradually. This can be due to a number of factors such as the lobbying power of interest groups, contractual obligations, overhead costs of dismantling an existing system as well as ambiguities regarding the permanency of a change(Nordhaus *et al.*, 2012). Such effects can be examined through a series of adjustments in the military expenditures between subsequent years where the country tries to reach the desired long run equilibrium level. As a result, in this study we adopt a partial adjustment process (Nerlove, 1958) of the form

$$MX_t - MX_{t-1} = \delta(MX_t^* - MX_{t-1}). \quad (1)$$

Here, MX_t is the actual and observed level of military expenditure at time t while MX_t^* is the desired and unobserved long run level. Also, $0 < \delta < 1$ is the coefficient of adjustment such that $MX_t - MX_{t-1}$ shows the actual change in military expenditures so that $MX_t^* - MX_{t-1}$ represents the desired change. If $\delta = 1$, the actual military expenditures are equal to the desired level. On the other extreme, $\delta = 0$ implies that military expenditures cannot reach their long run equilibrium.

Equation 1 can be rearranged as

$$MX_t = \delta MX_t^* + (1 - \delta) MX_{t-1}, \tag{2}$$

which can be used with a general demand model

$$MX_t^* = \alpha_0 + \alpha_m \sum_m X_{m,t} + u_t, \tag{3}$$

where X_m is a $m \times 1$ vector of explanatory variables explanatory of military expenditures, α are parameters to be estimated and u_t is the error term satisfying the usual conditions.

Combining Equation 3 and Equation 2 provides the econometric model in log form as follows:

$$\ln MX_t = \delta \ln \alpha_0 + \delta \alpha_m \sum_m X_{m,t} + (1 - \delta) \ln MX_{t-1} + \delta u_t. \tag{4}$$

For the estimation of the above model, we employ the SUR technique developed by Zellner (1962). SUR is a panel regression method comprised of a system of equations that exhibit contemporaneous cross-equation error correlation. In this approach, even though the equations are separate and seemingly independent, they are actually related through correlations in the respective error terms. These are especially useful for the analysis of military expenditures in the Gulf Region because in this case the countries involved tend to determine their level of military expenditures by taking into account a large number of common or interrelated factors and threats common to the region. Such complex relationships cannot be fully specified in a regression model and therefore manifest themselves in the error term. The SUR method takes into account such unobserved relationships in order to obtain coefficient estimates which are not only less biased, but also substantially more efficient.

Our final specification for panel estimation is given below:

$$\ln MX_{i,t} = \beta_{i,0} + \beta_{i,m} \sum_m X_{i,m,t} + \theta_i \ln MX_{i,t-1} + v_{i,t}, \tag{5}$$

where i represents the eight Gulf Region countries namely Saudi Arabia, Iran, Iraq, Kuwait, Bahrain, Qatar, UAE, and Oman in that order. The β_m parameters provide the short run elasticities with respect to X_m. θ_i are such that $1-\theta_i$ gives the adjustment parameter δ_i for each country. The long run elasticities are obtained by dividing β_i, m by $1-\theta_i$.

For the empirical work, we let X be a vector of explanatory variables widely discussed in the literature. We categorize these into two groups namely economic variables and strategic variables. The first group includes real gross domestic product (GDP), population size, and real oil price. Real GDP is expected to capture the relation between defense and economic growth. The use of this variable also provides the income elasticity of military expenditures. Because military expenditure is considered to be a normal good, we expect a positive sign. Population can have either a positive or negative effect on military expenditures. Countries with a large population may be less prone to external threats and thus require smaller armies (Collier and Hoeffler, 2007). Also, a larger population may decrease military expenditures due to the increased demand for civilian consumption goods (Kollias *et al.*, 2018). However, it is also suggested that military spending can increase with population due to more people contributing (Dudley and Montmarquette, 1981). Real oil price is another commonly used variable in the analysis of demand for military expenditures, especially for the Gulf Region. An increase in oil price may provide the governments with additional financial means to be used for military purposes. Hence, a positive relation between oil price and military expenditures is expected.

Our second group of variables, the so-called strategic variables, include the military expenditure of the rival country/countries as well as the total military expenditures of the allies in the region. The rival country is Saudi Arabia for Iran, and Iran for the rest of the countries. In addition to the rivals, it is also important to include the ally countries in order to measure the *spill in* effects of military expenditures with respect to others. In our model, for all countries except Iran, the ally is the GCC countries. Since Iran does not have an ally in the region, its ally variable shows the rest of the GCC countries in order to determine the degree to which GCC countries diverge from Saudi Arabia, the leading military power. Furthermore, as is well known, the US is an ally for GCC countries, but it is also a threat for Iran. Therefore, the elasticities with respect to US military presence are also estimated as a third strategic variable.

Our data on real military expenditures in 2017 US dollars are retrieved from Stockholm International Peace Research Institute (SIPRI, 2019). We obtain the real income series also from the same resource based on military expenditures as percentage of GDP. For the both cases, we calculate the missing values for some countries and for some years by using the growth rates of the corresponding data provided by the World Military Expenditures and Arms Transfers reports (Bureau of Arms Control, 2019). The population series are obtained from World Development Indicators by the World Bank (2019), while the real oil prices are provided by Energy Information Administration (EIA, 2019b). To account for the US military presence in the region, we use the number of US active duty military personnel as suggested by Spangler (2018). Our final dataset is annual and covers the period between 1980 and 2016.

Figure 1 provides the individual time series plots of the logs of real military expenditures as well as real GDP for the eight countries. It is easily seen that there are substantial variations in terms of both military expenditures and GDP, which point out the different levels of threat and therefore different security needs across the region.

3 Empirical Results

The SUR model estimates are presented in Table 1[2]. Each column in the table gives individual regressions for the eight Gulf Region countries. Since the partial adjustment model is known to be susceptible to autocorrelation, the results of the Ljung-Box Q test (Ljung and Box, 1978) are also provided at the bottom of the Table. The p-values show that the null of independence is not rejected at the 5 per cent level in all cases. Furthermore, we also perform a Doornik and Hansen (2008) test for normality of the error term where the H_0 is also not rejected with a p-value of 0.385.

In the table, it is seen that the parameter estimates have the expected signs in general. Despite the relatively small sample size, a large proportion of the coefficients are found statistically significant thanks to the improved efficiency provided by the SUR method. In particular, the lagged military expenditures have a positive and significant effect on military expenditures in all specifications, confirming the existence of inertia. This finding is line with that of Al-Hamdi (2012). The adjustment coefficient is calculated as 1 minus the estimated coefficient. It is observed that the coefficient of adjustment is generally high across the region, which is not surprising given the fact that these countries are some of the largest military spenders in the world. For example, in Saudi Arabia, 65 per

[2]Gretl 2019c (64bit) was used. Our data and code are available upon request.

cent of the discrepancy ($1 - 0.3539 = 0.6461$) between the desired and actual military expenditures is eliminated on average each year. Other countries have relatively high or low adjustment rates which can be explained with different levels of threat, economic problems as well as free riding behavior on other, bigger countries. Also noteworthy is the rather low adjustment rate for Iran ($1 - 0.7267 = 0.2733$). This can be due to the international sanctions constraining its ability to adjust military spending towards the optimal level.

The results reveal that the determinants of military expenditure show substantial variations across different countries. For example, real GDP has a positive effect on military spending in Saudi Arabia, Iran, Iraq, and Bahrain. In some of the smaller countries such as Qatar, UAE, and Oman; this particular coefficient is not statistically significant. In Kuwait, the demand for military spending decreases as income increases, which surprisingly indicates that security is perceived as an inferior good. As for the effects of population, we again observe that countries respond differently. Here, a positive effect is generally explained with more people contributing to defense services (Dudley and Montmarquette, 1981), while a negative effect indicates an increased priority to civilian needs as population increases, supporting the findings of Farzanegan (2018). The results show that the former is more prevalent in Kuwait, while the latter effect seems to dominate in Iran, Iraq, and Bahrain. There is a diversity in terms of response to the changes in oil price as well. We see that the price of oil has a significant effect only in Kuwait, Bahrain and Oman. For other countries such as UAE and Qatar an insignificant effect may be explained with the increased efforts toward economic diversification in order to reduce dependency on oil revenue (Al-Hamdi, 2012). Indeed, Haouas and Soto (2016) also show that the UAE seems to have escaped from the oil curse by diversifying the economy by adopting policies for market deregulation, and efficient provision of infrastructure and institutions to encourage private sector participation.

The results reveal some interesting findings regarding the strategic variables as well. First and foremost, it is seen that both Saudi Arabia and Iran react positively to the military expenditures of each other. This confirms that the two countries see the opposite side as a threat, although the other countries do not seem to treat Iran in the same way. As for the effect of the military expenditures in the rest of the Gulf countries, we observe that Saudi Arabia, Iraq, Bahrain and Qatar increase their military spending to keep up with the other countries in the region. This indicates that there is perhaps no free riding among GCC countries. However, one cannot speak about such behavior in terms of the US military presence. Iraq, Bahrain, Qatar and Oman decrease their military expenditures in response to an increase in the US spending. This shows that these countries rely on the US for their external security. This is partly related with the Defence Cooperation Agreement between the US and Qatar as well as the strategic partnership between the US and Iraq. Also, the US is the ultimate security guarantor of Bahrain (Vittori, 2019). Consequently, the results show that Kuwait is the only country viewing the US military expenditure as complimentary even though it relies on the US for protection as well.

An important implication of the model results is that the determinants of military expenditures not only differ but also exhibit large variations in different countries. We test this hypothesis by running a series of Wald tests with the null hypothesis of coefficient constancy for different parameters in the equation system. For the case of the adjustment parameter, the proposition that $(1-\theta)$ is equal across the eight countries is rejected with a p-value of 0.0015. We run similar tests on other parameters and obtain similar results in all cases. We encounter only one exception, which is the parameter for the military expenditure of allies. Here, the statistical test provides a p-value of 0.5389 for the six GCC countries only. In other words, the hypothesis that the GCC countries do not free ride on each others' military expenditures is not rejected. As interesting as this may be, our tests confirm that, on the whole, military expenditures are influenced by different factors and with a high degree of heterogeneity in the region.

Finally, Table 2 presents both the long run and the short run elasticities of the model variables. In line with the theory, the long run elasticities are larger than their short run counterparts in all countries. In particular, the income elasticities are substantially higher in Iran and Bahrain, exceeding 1. We see that the sensitivity of military expenditures to the changes in population also increases over time. In Iran, Iraq, Bahrain, and Kuwait this elasticity becomes greater than unity in the long run. The diverse behaviour across countries is also evident in terms of oil price. For Kuwait, the short run elasticity with respect to oil price is 0.53, while it is -0.09 and 0.18 for Bahrain and Oman respectively. As for the effect of rival country's military expenditure, it is seen that Iran is more responsive to Saudi Arabia than vice versa. All GCC countries except Kuwait respond positively to Iran's military spending. The long run elasticity is the lowest for Qatar (0.03) and the highest for Iraq (1.45). Finally, the elasticity with respect to US military presence in the region is negative in Iraq, Bahrain, Qatar and Oman; although it is also low in general. It is important to note that for the parameters which are not statistically significant, the long run elasticity is considered to be insignificant as well.

4 Conclusion

The eight countries in the Gulf Region face important challenges in terms of education, health, employment, poverty and income inequality. Yet, these countries have been raising their military spending at the cost of other forms of government expenditures. Therefore, it is important to analyze and understand the need for such increased levels of military spending. Here, we propose a partial adjustment framework in order to investigate the determinants of military expenditures in this volatile region, which also controls about 50 per cent of global oil reserves. Our approach makes it possible to capture rigidities such as bureaucratic inertia in military expenditures, thereby allowing to estimate elasticities both in short run and long run. In addition, our estimation procedure is based on the SUR method, which accounts for intercountry correlations that are difficult to specify in a standard regression model. Furthermore, in order to examine the effect of strategic factors, we include the military expenditures of both the rival and the ally countries as well as the US military presence along with other control variables.

Our findings based on data for the period between 1980 and 2016 indicate that military expenditures are influenced jointly by economic and strategic factors. Moreover, there exists a high degree of heterogeneity across the countries in the region. While some countries respond more to economic factors, some countries react to the behavior of their rivals and allies. In particular, both Saudi Arabia and Iran respond to the military spending of the opposite side while smaller nations such as Bahrain, Qatar and Oman tend to free ride on the US presence in the region. In general, GCC countries seem to coordinate their levels of military spending. Empirical results also point out that lagged military expenditures have a positive and statistically significant effect in all countries, indicating the existence of inertia. The rate of adjustment is the highest in Kuwait, Saudi Arabia, and Oman, implying a rapid convergence toward the desired level. On the other hand, the coefficient of adjustment is relatively low in UAE and Iran. Our findings also show that income and population play an important role on military expenditures, although the respective elasticities again vary across different countries. Short run elasticity with respect to income is positive but less than one in Saudi Arabia, Iran, Iraq and Bahrain implying that military spending is a necessity. As expected, long term income elasticities are found to be higher than their short run counterparts in all of the eight countries.

In terms of the security web hypothesis, our estimates reveal interesting findings, which can also provide important policy implications. First of all, six of the eight countries in this study are members of GCC, which is not merely a military alliance, but also an economic one as well. Our results show that these countries do not free ride on each others' military expenditures, however, their economic variables nonetheless show high variations. This implies that better coordination among the GCC countries is necessary to reduce military spending in favor of development programs. Such planning can also bring more flexible policies to avoid long-term defense contracts, an important obstacle for reducing military expenditures in the region (Jarzabek, 2016). Second, our results also raise important issues regarding the role of the US in the region. We see that while Kuwait views the US military presence as a complement; Iraq, Bahrain and Qatar regard it as a substitute, resulting in free riding behavior. If the US decides to reduce its military spending in the region, these countries may in turn need to increase their military spending. As argued by Spangler (2018) 'why US spends so much on security so that other countries can free ride is another question to ask'. Last but not least, we see that oil prices have been influential in the military expenditures of some countries namely Kuwait, Bahrain, and Oman. Therefore, these countries have more to gain by diversifying their economies to decrease dependence on oil revenues. In conclusion, it is our understanding that the the eight countries as well as the US may benefit from reevaluating their security policies in the Gulf Region.

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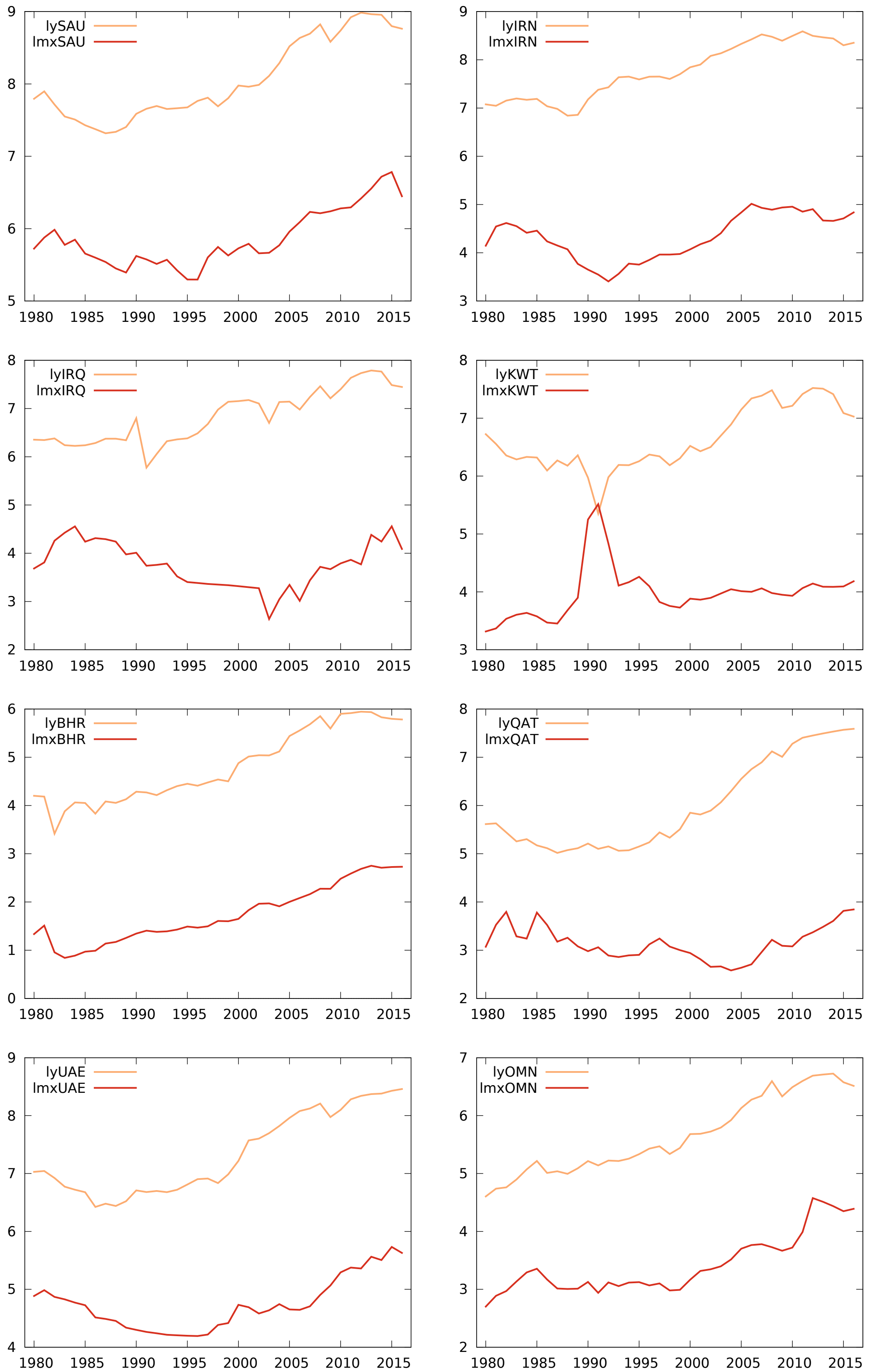

Figure 1: Time series plots of the logs of real military expenditures and real GDP for Saudi Arabia, Iran, Iraq, Kuwait, Bahrain, Qatar, United Arab Emirates, and Oman (Left to right, top to bottom.)

Table 1: Regression Estimates for the SUR Model

Dependent variable: *Log of real milex*

	Saudi Arabia	**Iran**	**Iraq**	**Kuwait**	**Bahrain**	**Qatar**	**UAE**	**Oman**
Constant	1.0012*	3.8218**	2.4944**	2.9365***	−0.8883***	−0.2097	−0.2012	−1.5076***
	(0.5551)	(1.5508)	(1.2121)	(0.5505)	(0.1515)	(0.5521)	(0.2847)	(0.4058)
Log of real milex (−1)	0.3539**	0.7267***	0.5329***	0.3413***	0.6825***	0.5121***	0.7601***	0.5090***
	(0.1424)	(0.0764)	(0.1042)	(0.0758)	(0.0579)	(0.1462)	(0.1152)	(0.0997)
Log of real GDP	0.4606***	0.3851***	0.2282*	−0.6154***	0.6549***	−0.0371	0.0233	0.1571
	(0.1632)	(0.1079)	(0.1323)	(0.1091)	(0.0606)	(0.2283)	(0.1058)	(0.1884)
Log of population size	−0.3261	−1.0272***	−0.8597**	0.6712***	−0.5515***	−0.0045	0.0825	0.3595
	(0.2181)	(0.3126)	(0.3491)	(0.1590)	(0.1450)	(0.1903)	(0.0744)	(0.3054)
Log of real price of oil	−0.1211	−0.0604	−0.0125	0.5245***	−0.0932***	0.0817	0.0491	0.1788*
	(0.0930)	(0.0811)	(0.1258)	(0.0875)	(0.0330)	(0.1073)	(0.0598)	(0.0964)
Log of real milex of rival[1]	0.1758*	0.3596***	0.0586	−0.7206***	−0.0832**	0.0130	0.0322	0.0215
	(0.0969)	(0.1196)	(0.1198)	(0.1408)	(0.0322)	(0.1685)	(0.0822)	(0.0753)
Log of real milex of ally	0.3028**	−0.2818***	0.6784***	0.0795	0.1308**	0.5023*	0.1428	0.0709
	(0.1194)	(0.1008)	(0.2231)	(0.1643)	(0.0532)	(0.2604)	(0.1252)	(0.1348)
Log of total US military	−0.0179	0.0156	−0.0654**	0.1398***	−0.0234***	−0.0666**	−0.0114	−0.0313*
personnel in the region	(0.0182)	(0.0170)	(0.0318)	(0.0217)	(0.0069)	(0.0290)	(0.0200)	(0.0171)
t	36	36	36	36	36	36	36	36
$\bar{R}^2$	0.937	0.951	0.859	0.878	0.993	0.779	0.956	0.956
Regression std. error	0.099	0.105	0.177	0.151	0.047	0.162	0.093	0.103
Ljung Box Q (p-value)	0.779	0.854	0.137	0.653	0.051	0.534	0.630	0.402

Note: Standard errors in parentheses. *** indicates significance at the 1% level. ** and * idem, 5% and 10%.

[1] The rival country is Saudi Arabia for Iran, and Iran for the rest of the Gulf countries. For Iran, the ally variable shows the rest of the GCC countries for comparison since Iran does not have an ally in the region. For the remaining seven, the ally is the GCC countries.

Table 2: Point estimates of long run and short run elasticities of the model variables

Long Run Elasticities								
Variable	**SAU**	**IRN**	**IRQ**	**KWT**	**BHR**	**QAT**	**UAE**	**OMN**
Real GDP	0.713	1.409	0.489	−0.934	2.063	−0.076	0.097	0.320
Population	−0.505	−3.759	−1.841	1.019	−1.737	−0.009	0.344	0.732
Price of oil	−0.187	−0.221	−0.027	0.796	−0.294	0.167	0.205	0.364
Milex rival	0.272	1.316	0.125	−1.094	−0.262	0.027	0.134	0.044
Milex ally	0.469	−1.031	1.452	0.121	0.412	0.030	0.595	0.144
US presence	−0.028	0.057	−0.140	0.212	−0.074	−0.137	−0.048	−0.064
Short Run Elasticities								
Variable	**SAU**	**IRN**	**IRQ**	**KWT**	**BHR**	**QAT**	**UAE**	**OMN**
Real GDP	0.461	0.385	0.228	−0.615	0.655	−0.037	0.023	0.157
Population	−0.326	−1.027	−0.860	0.671	−0.552	−0.005	0.083	0.360
Price of oil	−0.121	−0.060	−0.013	0.525	−0.093	0.082	0.049	0.179
Milex rival	0.176	0.360	0.059	−0.721	−0.083	0.013	0.032	0.022
Milex ally	0.303	−0.282	0.678	0.080	0.131	0.502	0.143	0.071
US presence	−0.018	0.016	−0.065	0.140	−0.023	−0.067	−0.011	−0.031
Rate of adj.	0.646	0.273	0.467	0.659	0.318	0.488	0.240	0.491