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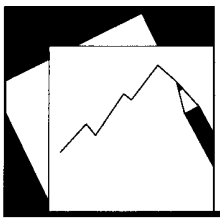

IMF Working Paper

How Strong are Fiscal Multipliers in the GCC?
An Empirical Investigation

Raphael Espinoza and Abdelhak Senhadji

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How Strong are Fiscal Multipliers in the GCC?
An Empirical Investigation

Prepared by Raphael Espinoza and Abdelhak Senhadji[1]

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Abstract

The effectiveness of fiscal policy in smoothing the impact of shocks depends critically on the size of fiscal multipliers. This is particularly relevant for the GCC countries given the need for fiscal policy to cushion the economy from large terms of trade shocks in the absence of an independent monetary policy and where fiscal multipliers could be weak dues to substantial leakages through remittances and imports. The paper provides estimates of the size of fiscal multipliers using a variety of models. The focus is on government spending since tax revenues are small. The long-run multiplier estimates vary in the 0.3–0.7 range for current expenditure and 0.6–1.1 for capital spending, depending on the particular specification and estimation method chosen. These estimates fall within the range of fiscal multiplier estimates in the literature for non-oil emerging markets.

JEL Classification Numbers: E62; H30

Keywords: Gulf Cooperation Council; government spending; fiscal policy

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I. INTRODUCTION

The Gulf Cooperation Council (GCC) is a group of six economies[2] of the Persian Gulf, which share a common production structure based on a state-owned hydrocarbon sector and a non-oil sector dependent on imports and foreign workers. The high volatility in oil prices implies that these economies are buffeted by huge terms of trade shocks. Fiscal policy is the main macroeconomic stabilization tool at the disposal of the authorities given the peg to the dollar in all countries but Kuwait.[3] Furthermore, fiscal policy has to strike a balance between a short-term countercyclical role and long-term diversification objectives.

But how effective is fiscal policy in the GCC region? The question of the effectiveness of fiscal policy in smoothing the impact of shocks is particularly relevant in the GCC, a region characterized by heavy reliance on foreign workers and imports. As a result, leakages through remittances and imports could weaken significantly fiscal multipliers. On the other hand, fiscal policy in the GCC plays an important catalyst role for private-sector activity through the cofinancing of infrastructure projects and through consumer and investor confidence, which would imply large fiscal multipliers in the GCC.

Despite their operational importance for policymakers and analysts, reliable estimates of fiscal multipliers in oil exporting countries in general, and the GCC in particular, are not available. The existing literature has focused on industrialized and non-oil emerging and developing countries. A notable example is Ilzetski, Mendoza, and Végh (2010), who provide econometric estimates of fiscal multipliers for a large number of emerging markets and developing countries, carefully taking into account the endogeneity of fiscal spending. As the authors point out "drawing sweeping generalizations on the size of fiscal multipliers is probably an exercise in futility." In particular, they show that (i) government consumption has a smaller short-run effect on output and a less persistent one in developing countries than industrialized countries, and (ii) the long-run multiplier varies considerably, with economies closed to trade or operating under a fixed exchange rate regime exhibiting the largest multipliers.

This lack of empirical estimates of fiscal multipliers for oil exporters motivated this study on GCC countries, using a variety of econometric models and controlling for the standard endogeneity problem.[4] Our focus is on spending multipliers as opposed to revenue multipliers because most of the revenue comes from hydrocarbon exports as little is derived

[2] Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates.

[3] The Kuwaiti dinar is pegged to a basket of currencies.

[4] See Ilzetski and Végh (2008); and Ilzetski, Mendoza, and Végh (2010) for a discussion of the problems associated with the estimation of fiscal multipliers.

from non-oil taxes. Hence, fiscal policy is tantamount to expenditure policy in the region. The estimation results show that the long-term multipliers were in the 0.3–0.7 range for current expenditure and 0.6–1.1 for capital spending, depending on the particular specification and estimation method chosen.

The paper is organized as follows. In Section II, we show, using simple VAR models, that fiscal expenditure is a major driver of growth in the Saudi non-oil sector. Section III discusses the issue of endogeneity of spending and how it may affect the fiscal multiplier estimates, and Section IV presents some panel results for the Gulf region. Section V summarizes our results and compares them with those found in the literature on emerging markets.

II. BACKGROUND

In the GCC, the public sector plays an important role in the economy. Government spending amounts to between 36 percent and 76 percent of non-oil GDP (Table 1) and fiscal revenue comes mainly from hydrocarbon exports and investment income, whereas non-oil fiscal revenue—including income taxes, corporate taxes, and VAT—represents only a small share of total revenue. Government spending, three-fourth of which in the form of current spending, is therefore the main instrument of fiscal policy.

Table 1. Characteristics of GCC Economies

Average 2000–09	Bahrain	Kuwait	Oman	Qatar	Saudi Arabia	U.A.E.
Current expenditure/total expenditure	0.76	0.88	0.72	0.70	0.80	0.83
Capital expenditure/total expenditure	0.24	0.12	0.28	0.30	0.20	0.17
Government expenditure/non-oil GDP	0.36	0.79	0.66	0.64	0.66	0.36
Hydrocarbon-related revenues	0.77	0.73	0.84	0.66	0.86	0.73
Investment income 1/	0.01	0.22	0.04	0.24	0.02	0.12
Taxes and others	0.22	0.05	0.12	0.11	0.12	0.14
Imports of goods and services/nominal GDP	0.71	0.35	0.39	0.35	0.34	0.68
Share of non-national in total population (2005)	0.41	0.62	0.24	0.72	0.27	0.79
Spending and oil prices						
R-square (1991–2007)	0.10	0.29	0.30	0.55	0.79	0.20

Sources: Country authorities; and IMF staff estimates.

1/ Investment income for Bahrain includes other capital revenues.

Note: Regressions of the growth rate of nominal spending on contemporaneous and lagged oil price inflation.

Because non-oil government revenue is small, government spending is eventually constrained by oil revenue, which implies a positive correlation between expenditure and oil prices. This relationship is tighter for Saudi Arabia and Qatar (Table 1). The procyclicality of fiscal policy during good times has been documented recently by Abdih et al. (2010) who found that, in the Middle East, fiscal policy was significantly less procyclical during recessions and that during the current recession, fiscal policy has been largely

countercyclical. Indeed, Saudi Arabia implemented the largest fiscal stimulus (relative to GDP) among the G-20.

But how effective is fiscal policy in the GCC? Imports account for a large fraction of GDP and foreign workers—who have a high marginal propensity to save and remit abroad—represent the majority of the labor force. As a result, a significant share of government spending leaks abroad through imports and workers' remittances, and the multipliers could be small, as in many open emerging economies. On the other hand, fiscal policy in the GCC plays an important catalyst role for private-sector activity through the cofinancing of infrastructure projects and through consumer and investor confidence, which would imply large fiscal multipliers in the GCC. Furthermore, Ilzetski, Mendoza, and Végh (2010) show that fixed exchange rate regimes tend to strengthen the effect of fiscal policy.

III. Endogeneity and the Fiscal Multiplier

A. Endogeneity in the Fiscal Policy Literature: A Bird's Eye View

The estimation of many macroeconomic relationships raises the concern of potential endogeneity of the explanatory variables. In the particular case at hand, the relationship of interest is that between an indicator of economic growth and an indicator of fiscal spending. The problem is that the relationship might be bidirectional (i.e., fiscal spending influences economic growth and vice-versa). Failing to control for the endogeneity of spending may lead to the well-known *simultaneity bias*.[5] In the fiscal multiplier literature, the bias may result from the following two channels:

- ***Automatic fiscal stabilizers.*** During periods of expansion, spending tends to decrease (through lower unemployment benefits, for example) and tax revenue increases with higher economic activity. The reverse is true during periods of contraction. Therefore, the correlation between spending and economic activity tends to be negative. Not controlling for this relationship leads to the underestimation of fiscal multipliers. In the case of the GCC countries, we can safely rule out this channel since fiscal policy is mainly driven by spending—as fiscal revenue comes predominantly from oil—which is largely *autonomous*.

- ***Endogenous fiscal policy.*** Systematic countercyclical policies may give the impression that fiscal expansions have limited effects since they will be implemented during bad times. Again, this source of endogeneity is likely to be of a lesser importance in the GCC

[5] Another potential source of bias may come from the fact that the fiscal multiplier is theoretically zero in periods of full employment. By mixing periods of full- and under-employment, the multiplier estimate may be downward biased.

since fiscal policy was relatively *acyclical* during periods of weak economic activity as documented by Abdih et al. (2010).

The standard method for dealing with potential endogeneity is to use instrumental variables or VARs to allow for feedback effects. In the latter case, however, the issue of ordering of variables arises. The literature has relied on the following two methods to control for the potential endogeneity of fiscal policy:[6]

- ***Contemporaneous exogeneity argument.*** The standard method to control for endogeneity is to recognize that fiscal policy is generally not flexible enough to react quickly to economic activity. Using this line of reasoning, Blanchard and Perotti (2002) estimated a quarterly VAR with U.S. GDP, tax revenue, and total spending. The key to the identification procedure was to recognize that the use of quarterly data virtually eliminates the endogeneity bias: fiscal policy cannot react fast enough to be endogenous to current quarter GDP. The second element in their identification procedure was to estimate directly the behavior of the automatic fiscal stabilizers (applying the OECD method, see Giorno et al.,1995) to constrain the structural coefficient and thus deduce some reduced-form coefficients in the VAR.[7]

- ***Using case studies.*** Case studies looked at specific experiments. For instance, Romer and Romer (2008) analyzed the effect of tax policy changes using detailed information on policy decisions to identify the size and timing of policy changes in the United States. This allowed them to identify structural shocks such as changes in taxes that are exogenous to the business cycle and estimate their effects on GDP in an OLS quarterly model. A VAR is also analyzed for robustness. We will present below a specific experiment for Saudi Arabia using detailed information on the wage structure in the public sector.

The literature that covers a cross-section of countries has taken the VAR route to control for the endogeneity bias, since finding detailed information on specific spending or tax programs for many countries is cumbersome. For instance, IMF (2008) estimates impulse responses for the G-7 countries using quarterly VARs with Choleski ordering of the output gap, the GDP deflator, changes in the nominal interest rate, the structural fiscal balance, and the cyclical fiscal balance. Perotti (2005, 2006) uses a different identification procedure but the methodology is also based on a quarterly structural VAR. Ilzetzki and Végh (2008) used Instrumental Variables, GMM, and simultaneous equation models on quarterly data from 49 countries to investigate both the size of multipliers and the importance of procyclicality.

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[6] See also the surveys in Spilimbergo et al., (2008), and Spilimbergo et al., (2009).

[7] See, for instance, the discussion on VAR identification in Perotti (2005) for more details.

They found that fiscal multipliers were generally underestimated in the literature. They also found that fiscal policy was generally procyclical in emerging markets with the fiscal multiplier peaking at 0.63 after three quarters.

IV. Estimation Results

We follow the literature in using a variety of econometric models in order to reduce uncertainty in our multiplier estimates. We start with a VAR model, apply an original case study to current spending in Saudi Arabia, and conclude with a panel model of the GCC.

A. Time Series Estimation of Fiscal Multipliers in Saudi Arabia

Identification using contemporaneous exogeneity

We first investigate the importance of fiscal shocks on the dynamics of non-oil GDP in Saudi Arabia. We focus on non-oil GDP rather than total GDP because activity in the oil sector is largely driven by conditions in the international oil market. We chose Saudi Arabia because it is the dominant economy in the GCC and it has relatively long time series. The model is a VAR linking real world GDP, Saudi Arabia real government expenditure (we follow Ilzetzki and Végh (2008), in deflating all fiscal variables by the CPI), and non-oil real GDP in Saudi Arabia (see variables in Figure 1).[8] It was estimated on the period 1975–2009.[9] The variables were converted into growth rates so that the ratio of the impulse responses can be interpreted as elasticities. The short-term multiplier is then obtained by dividing the elasticity by the ratio of real spending to non-oil GDP.[10] The long-term multipliers (in terms of real non-oil GDP) will be obtained by cumulating the impulse responses and dividing the total by the ratio of real spending to real non-oil GDP.

The VAR was estimated in growth rates using three lags.[11] The identification procedure is based on a Choleski orthogonalization, with fiscal expenditure ordered before non-oil growth

[8] Both for the VAR and the panel model used later in the paper, we use total government expenditure, despite the criticism formulated in Ilzetzki and Végh (2008) against the inclusion of interest payments and transfers in the data, because we do not have such detailed description of expenditure before 1990. In any case, both transfers and interest payments represent a very small portion of spending in the GCC (interest payments averaged 4.8 percent of total spending, and rarely exceeded 10 percent of spending).

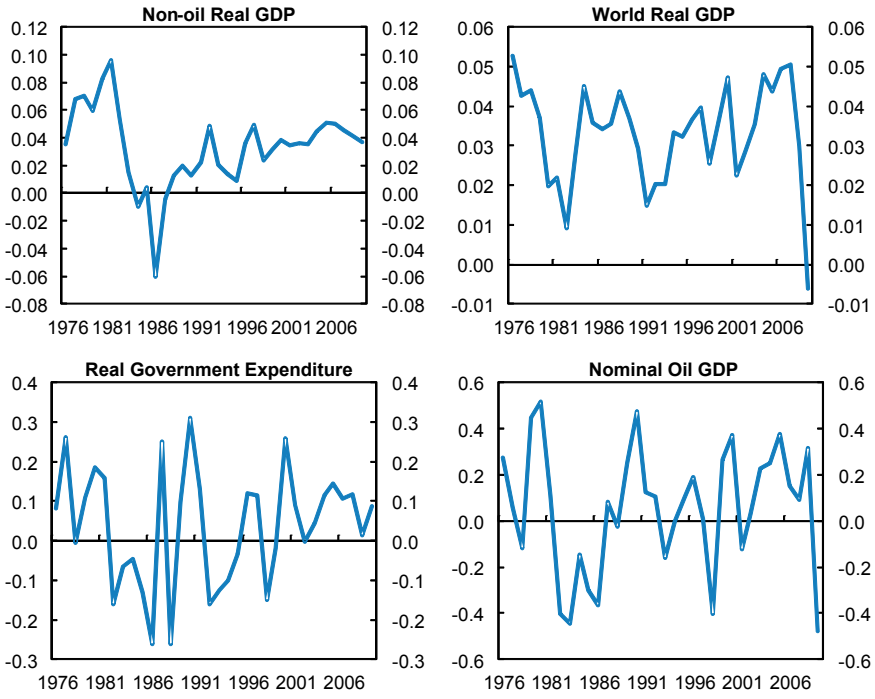
[9] While data are available starting in 1968, the coefficients estimates were unstable when using data between 1968 and 1975.

[10] Denoting real non-oil GDP by Y and real government expenditure by G, the elasticity is $\alpha = (\Delta Y/Y)/(\Delta G/G)$, and therefore the multiplier is $\Delta Y/\Delta G = \alpha\, Y/G$. The ratio Y/G has evolved for Saudi Arabia, from a high of 1.5 in 1975 to a low of 0.5 in 2000, but is now at its historical average of about 0.7.

[11] The AIC criterion and the LR-test suggest using three lags while the BIC criterion suggests using two lags only. There were no major differences on the impulse response functions using two or three lags.

(i.e., there is no immediate effect of non-oil growth on fiscal expenditure). This identification procedure assumes that, because budgets are voted much ahead of their implementation, the effect of GDP on expenditure within a year is limited (as a robustness check, we use another identification technique in the case study below). World growth is ordered first as a control variable for the global environment. It also captures oil revenue since oil production and oil prices are largely driven by global demand.

Figure 1. Saudi Arabia: Non-oil GDP and Government Expenditure, 1976–2009



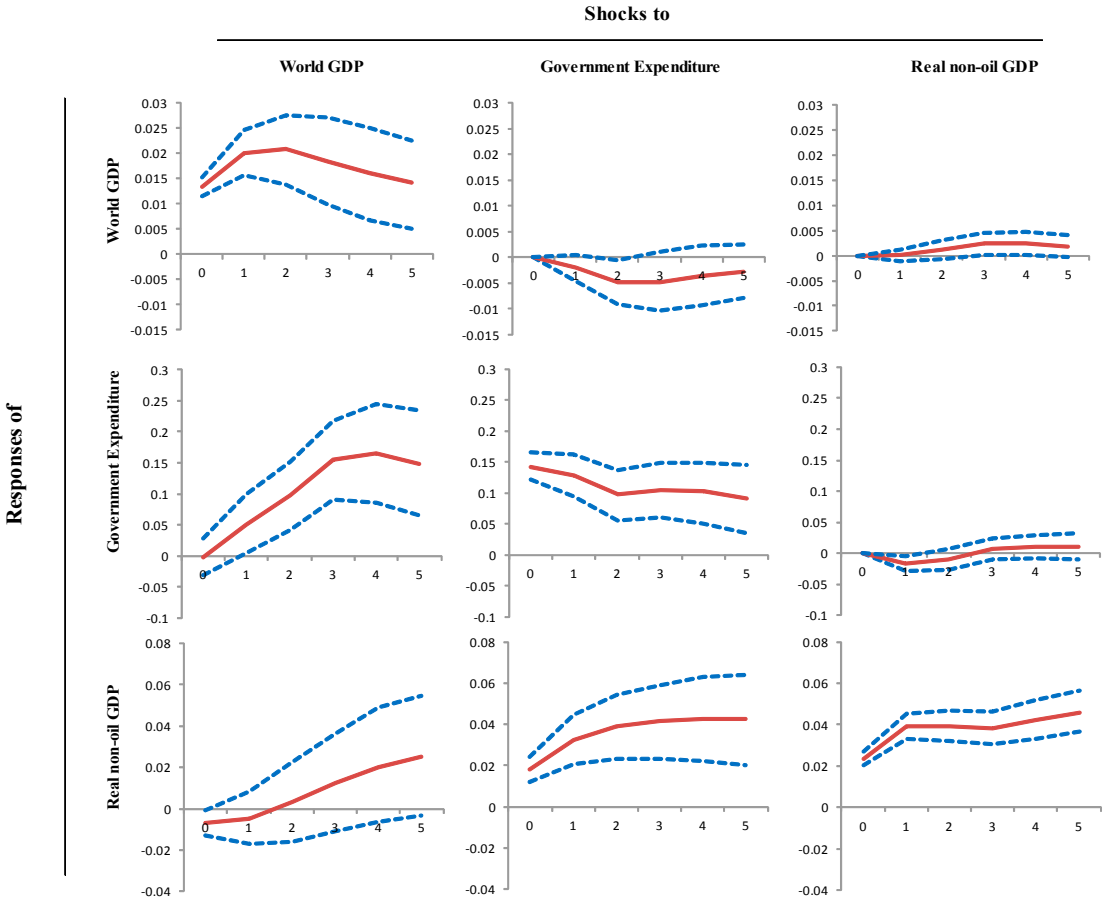
Sources: Country authorities; and IMF staff estimates.

We show in the lower-center graph of Figure 2 the effect of a shock to government spending on non-oil GDP. A 15 percent increase in fiscal expenditure improves non-oil GDP by 2 percent on impact, and by 5 percent after three years if the fiscal stimulus follows its historical dynamics (which is almost flat, according to the central graph in Figure 2). In Saudi Riyals (SRl) terms, this would imply that a SRl 1 increase in expenditures improves non-oil GDP by SRl 0.2 on impact and by SRl 0.5 in the long run.[12] An increase in non-oil GDP has very little effect on government expenditure even after a couple of years, which confirms our prior that endogeneity of fiscal policy is not a major issue in the GCC. World

[12] With the current 2008 baseline, government expenditures are SRl 510 billion and non-oil GDP is SRl 735.4 billion in current prices. The ratio of spending to non-oil GDP was around its long-term average.

growth has a positive effect on government spending (through higher oil revenues, see left-middle graph).

Figure 2. Fiscal Multiplier in Saudi Arabia



Sources: Country authorities; and IMF staff estimates.

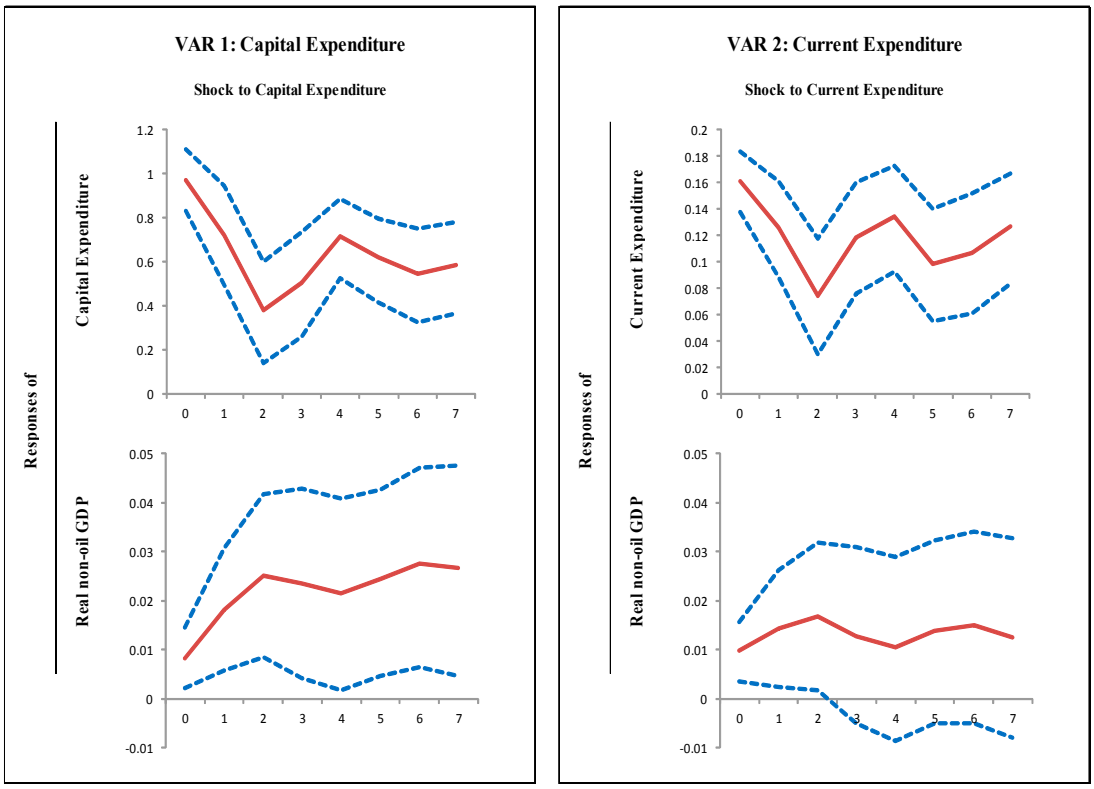
Note: One standard deviation (68 percent) confidence intervals. Variables are in growth rates and the impulse responses are cumulated. Impulses are presented for a one standard deviation shock of the orthogonalized error.

We also decomposed total government spending and ran separate VARs with current and capital spending. The results are shown in Figure 3. Current spending has a lower multiplier. In the short run, a 15 percent increase in current spending improves non-oil real GDP by 1 percent, which implies a multiplier of 0.1.[13] The long-run effect is almost unchanged.

[13] In 2007, the ratio of current spending to non-oil GDP was 0.54.

Capital spending has a stronger effect on growth (see left-hand side panel of Figure 3). On impact, a 10 percent increase in spending boosts non-oil GDP by 1 percent, which implies a multiplier of 0.5.[14] After three years, the elasticity doubled, and therefore the multiplier is around 1. We will revisit these estimates in the remainder of the paper, using panel data in order to increase statistical power.

Figure 3. Response of Non-Oil GDP to Current and Capital Expenditure Shocks



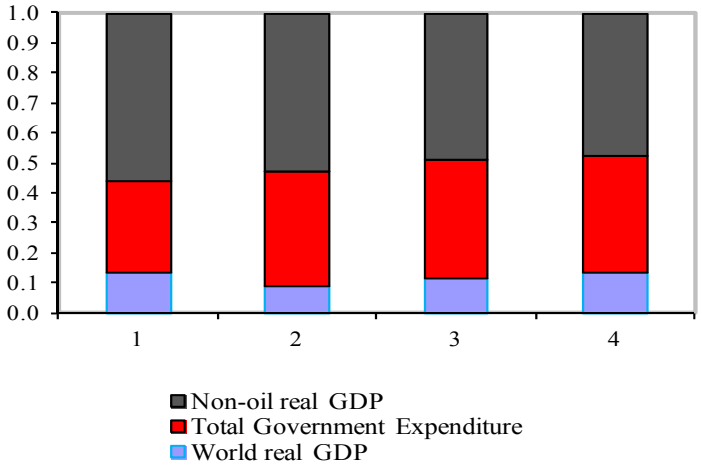
Sources: Country authorities; and IMF staff estimates.

Note: One standard deviation (68 percent) confidence intervals. Variables are in growth rates and the impulse responses are cumulated. Impulses are presented for a one standard deviation shock of the orthogonalized error.

Finally, we investigate whether government expenditure is indeed an important driver of non-oil GDP cycles. We show in Figure 4 the contribution of the different shocks to the variance of non-oil GDP in Saudi Arabia. The Forecast Error Variance Decomposition shows that government expenditure would account for about 30 percent of the variance generated by structural shocks in the short run, and about 40 percent over the medium term.

[14] In 2007, the ratio of capital spending to non-oil GDP was 0.185.

Figure 4. Saudi Arabia Non-oil GDP: Error Variance Decomposition



Sources: Country authorities; and IMF staff estimates.

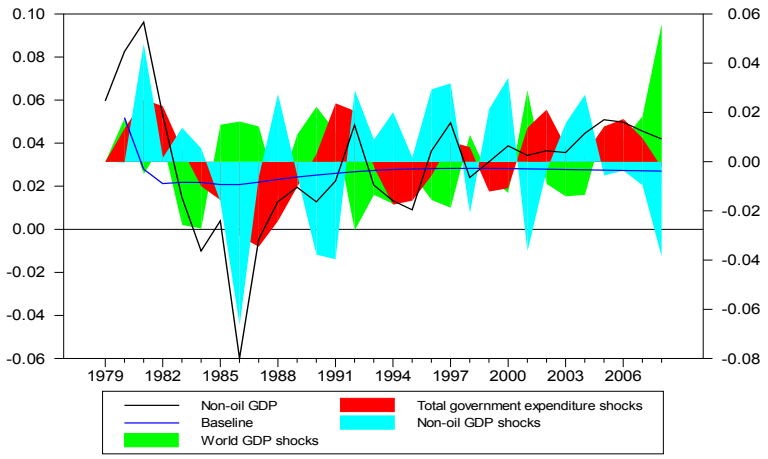
Note: The decomposition is based on a Choleski factorization with World GDP ordered first, followed by government expenditure and non-oil real GDP.

According to the historical decomposition (see Figure 5), restrictive fiscal policy contributed to the recession in 1986 and was the major cause behind the slow-down in the mid-1990s. Expansionary policies would have pushed activity in the late 1970s and in the last five years, on top of positive contributions from the world business cycle. A first look at the contribution of fiscal policy therefore suggests that government spending explains a large share of non-oil GDP variability despite relatively low multipliers. This is due to two factors: first, the weight of the government in the Saudi economy is high, at about 60 percent of non-oil GDP. Second, government spending has been historically volatile, with one-standard deviation shocks reaching 15 percent of total spending (see Figure 2, center graph), and therefore 9 percent of non-oil GDP.

Identification using a case study

The identification in the previous section has relied on the contemporaneous exogeneity argument. This argument has more validity with quarterly than with annual data. Unfortunately, as quarterly data are not available in the GCC, we had to rely on annual data. To check the robustness of the results in the previous section, we will use an institutional characteristic of current spending in Saudi Arabia as a potential instrument to estimate the effects of the current

Figure 5. Saudi Arabia: Non-oil GDP—Historical Decomposition



Note: The decomposition is based on a Choleski factorization with World GDP ordered first, followed by government expenditure and non-oil real GDP.

expenditure fiscal multiplier. Since 1991, Saudi Arabia's public sector employees receive a 13th month salary every two or three years according to the adjustment of the Gregorian calendar with the Islamic Hijri lunar calendar (which was used across Saudi Arabia prior to 1991 and is since used by the public service only). This provides us with an exogenous increase in spending that we use to identify wage spending shocks. In the years in which public servants received a 13th month salary, the wage bill was growing by 11.3 percent on average (as opposed to 0 percent otherwise) and non-oil growth was 3.9 percent (as compared to 3.1 percent otherwise). The data are presented in Figure 6.

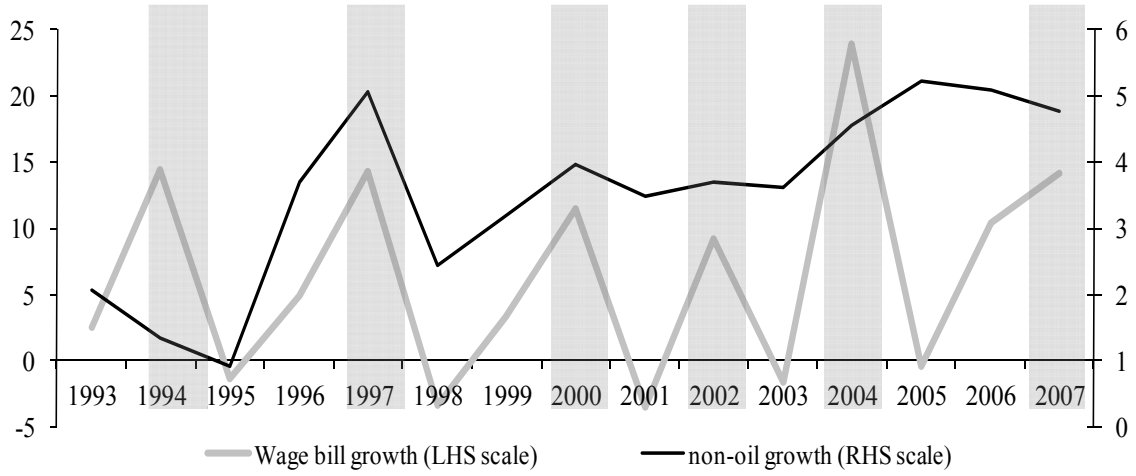
We estimate the elasticity of non-oil growth to the wage bill using a formal IV (2SLS) regression. The first-stage regression confirms the validity of the instrument, with a R^2 exceeding 50 percent. The second-stage regression suggests an elasticity of around 0.1.[15] Since the wage bill represented about a fourth of non-oil GDP over the period, the multiplier is therefore about 0.4. This result suggests that the multiplier calculated for current spending in the VAR (at 0.1) was probably underestimated.

B. Panel Estimates for the GCC Countries

The multiplier estimates in the previous section were based on Saudi Arabia time series data. The VAR analysis showed that capital spending was more effective than current spending in boosting non-oil growth and that government spending explains a large share of non-oil growth variance over the last 30 years. To check robustness of these estimates, we now turn to panel estimation

[15] The Sargan test applied to an overidentified model confirms that the instrument is indeed appropriate, which is not surprising since our instrument is actually deterministic.

Figure 6. Wage Bill and Non-Oil Real GDP Growth
(13th month salary years in shaded areas)



Sources: Country authorities; and IMF staff estimates.

C. Panel Estimates for the GCC Countries

The multiplier estimates in the previous section were based on Saudi Arabia time series data. The VAR analysis showed that capital spending was more effective than current spending in boosting non-oil growth and that government spending explains a large share of non-oil growth variance over the last 30 years. To check robustness of these estimates, we now turn to panel estimation using GCC data. This allows us to increase statistical power by increasing the number of observations. Panel estimation is particularly useful for the GCC in view of their very similar economic structures. The data for the six members of the GCC are presented in Figure 7. The comovement between non-oil growth and spending is clear. The United Arab Emirates was dropped as the fiscal data in this federal state is of dubious quality.

We first estimate a simple panel model of the GCC (Table 2) using Pooled OLS (POLS, columns 1, 5, and 9), random effects (RE, columns 2, 6, and 10), and fixed effects (FE, columns 3, 7, and 11). We also excluded contemporaneous spending to control for potential endogeneity of government spending (lag FE model).[16]

[16] We also used different IV models (not reported in Table 3). We tried oil prices as an instrument, but because high oil prices also benefit the petrochemical industry (the production of which is included in the non-oil GDP data), improve confidence, and ease financial conditions, exogeneity of the instrument was unlikely. Lagged spending proved also to be a weak instrument. As a result, we found the lag FE model, in which endogeneity is removed by construction, to be a safer alternative.

Table 2. Panel Estimates of GCC Fiscal Multipliers

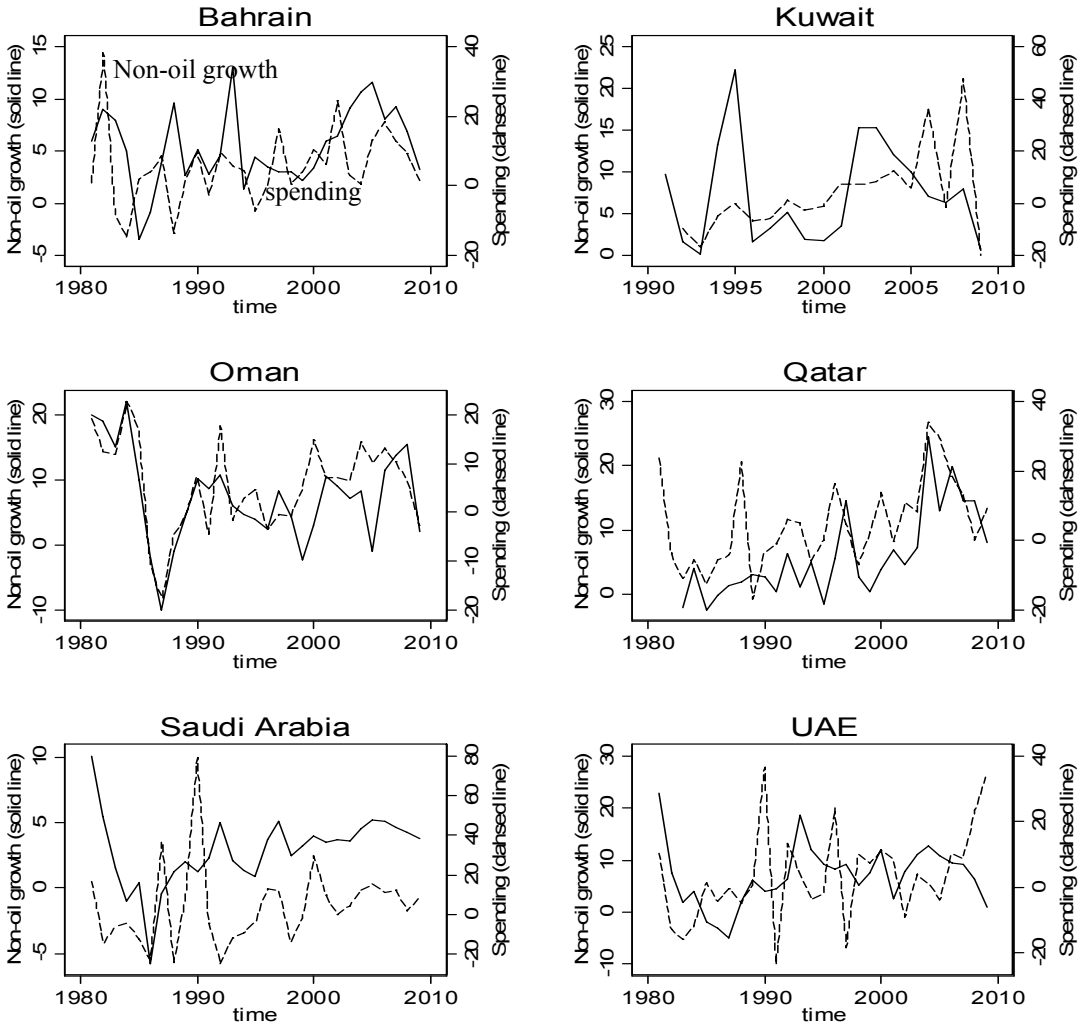
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Total Expenditure				Capital Expenditure				Current Expenditure			
VARIABLES	POLS	RE	FE	Lag FE	POLS	RE	FE	Lag FE	POLS	RE	FE	Lag FE
Δ Expenditure	0.233***	0.233***	0.233***									
	[4.088]	[5.102]	[4.934]									
Δ Expenditure (t-1)	0.160***	0.161***	0.161***	0.201**								
	[3.475]	[6.151]	[6.083]	[3.490]								
Δ Expenditure (t-2)	0.0891***	0.0892**	0.0897*	0.0908**								
	[2.722]	[2.221]	[2.173]	[3.186]								
Δ Capital Expenditure					0.0513***	0.0513***	0.0511**					
					[2.771]	[4.077]	[4.063]					
Δ Capital Expenditure (t-1)					0.0459**	0.0459***	0.0457***	0.0336*				
					[2.430]	[6.794]	[6.692]	[2.512]				
Δ Capital Expenditure (t-2)					0.0453***	0.0453***	0.0450***	0.0286**				
					[3.510]	[8.971]	[8.764]	[4.056]				
Δ Capital Expenditure (t-3)					0.0337***	0.0337***	0.0336***	0.0316**				
					[2.687]	[4.784]	[4.758]	[4.146]				
Δ Current Expenditure									0.235***	0.235***	0.241***	
									[3.277]	[7.553]	[6.968]	
Δ Current Expenditure (t-1)									0.103**	0.103***	0.108**	0.103*
									[2.427]	[4.030]	[3.674]	[2.190]
Δ Current Expenditure (t-2)									0.0436	0.0436	0.0472	0.0437
									[1.543]	[1.041]	[1.045]	[1.300]
Constant	0.0366***	0.0367***	0.0365***	0.0454***	0.0512***	0.0512***	0.0512***	0.0556***	0.0364***	0.0364***	0.0355***	0.0501***
	[7.545]	[6.877]	[6.395]	[9.218]	[9.416]	[21.16]	[44.20]	[51.32]	[5.455]	[5.533]	[5.321]	[8.744]
N.obs	156	156	156	156	139	139	139	139	144	144	144	144
R-squared	0.408		0.408	0.223	0.201		0.199	0.096	0.282		0.286	0.07
Breusch-Pagan p-value		0.255				0.143				0.306		
S-T multiplier	**0.33**	**0.33**	**0.33**	**0.29**	**0.33**	**0.33**	**0.33**	**0.22**	**0.44**	**0.44**	**0.45**	**0.19**
L-T multiplier	**0.69**	**0.69**	**0.69**	**0.42**	**1.13**	**1.13**	**1.13**	**0.60**	**0.71**	**0.71**	**0.74**	**0.27**

*** p<0.01, ** p<0.05, * p<0.1, t-statistics in brackets

The dependent variable is real non-oil GDP growth. Δ Expenditure (resp. Δ Capital Expenditure, resp. Δ Current Expenditure) is the log difference (≈ percentage change) of central government total (resp. capital, resp. current) expenditure, deflated by the CPI.

Source: Country authorities; and IMF staff estimates.

Figure 7. Non-oil GDP Growth and Total Government Expenditure in the GCC



Sources: Country authorities; and IMF staff estimates.

For all regressions, including the lag FE models, fiscal expenditure is positive and significant. Therefore, the data seem to rule out potential ricardian effects. For the capital expenditure models, the second and third lags are still significant.[17] Overall, our estimates suggest that the short-term fiscal multiplier[18] is around 0.3 for total government expenditure (columns 1 to 4),

[17] All t-statistics presented are computed using standard errors robust to heteroskedasticity.

[18] The fiscal multiplier is computed as the elasticity divided by the ratio of capital (or current or total) expenditure to GDP.

0.2–0.3 for capital expenditure (columns 5 to 8) and 0.2–0.4 for current expenditure (columns 9 to 12). A possible explanation of why the short-run multiplier on capital expenditure is weaker than that for current expenditure is the relatively long gestation lags for capital formation (i.e., it could take several years of investment before productive capacity is operational).

However, the long-run multiplier estimates suggest that the effect of capital expenditure on non-oil GDP is significantly higher than that for current expenditure: the long-run multiplier estimates range between 0.6 and 1.1 for capital expenditures versus 0.3 and 0.7 for current spending. Endogeneity did not seem to be a major issue since removing contemporaneous spending did not fundamentally change the multiplier estimates.

We tested the robustness of these results to the inclusion of control variables that are used in the literature (inflation, oil prices, interest rates, world growth (see Table 3). Contemporaneous oil prices were not significant but lagged oil price changes were found to affect non-oil growth. The Fed Funds rate and its lags, as well as world GDP growth, were not significant. Finally, current inflation was strongly correlated with growth and was also included. Overall, the inclusion of these variables does not significantly alter the results above.

Table 3. Panel Estimates of GCC Fiscal Multipliers—Robustness to Adding Control Variables

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Total Expenditure (FE)				Capital Expenditure (FE)				Current Expenditure (FE)			
VARIABLES												
Δ Expenditure	0.233***	0.206**	0.218***	0.192***								
	[4.934]	[4.453]	[5.680]	[5.179]								
Δ Expenditure (t-1)	0.161***	0.150***	0.121**	0.111**								
	[6.083]	[7.770]	[3.529]	[3.076]								
Δ Expenditure (t-2)	0.0897*	0.0941	0.0420	0.0451								
	[2.173]	[1.852]	[1.005]	[0.899]								
Δ Capital Expenditure					0.0511**	0.0422**	0.0346	0.0266				
					[4.063]	[3.605]	[1.901]	[1.532]				
Δ Capital Expenditure (t-1)					0.0457***	0.0418***	0.0298**	0.0269*				
					[6.692]	[7.122]	[2.892]	[2.218]				
Δ Capital Expenditure (t-2)					0.0450***	0.0377***	0.0297**	0.0230*				
					[8.764]	[7.395]	[3.403]	[2.295]				
Δ Capital Expenditure (t-3)					0.0336***	0.0327***	0.0200	0.0198				
					[4.758]	[4.760]	[1.689]	[1.619]				
Δ Current Expenditure									0.241***	0.208***	0.171*	0.131
									[6.968]	[6.464]	[2.392]	[1.681]
Δ Current Expenditure (t-1)									0.108**	0.0924**	0.0479	0.0285
									[3.674]	[3.467]	[0.771]	[0.432]
Δ Current Expenditure (t-2)									0.0472	0.0589	0.00589	0.0157
									[1.045]	[1.076]	[0.161]	[0.376]
Δ Oil Price (t-1)		0.0438**		0.0398		0.0778**		0.0683**		0.0696**		0.0686**
		[3.009]		[1.942]		[4.253]		[3.564]		[2.869]		[2.785]
Inflation			0.355**	0.358**			0.632**	0.627**			0.503	0.533
			[3.519]	[3.231]			[3.509]	[3.505]			[1.926]	[1.808]
Constant	0.0365***	0.0367***	0.0318***	0.0319***	0.0512***	0.0501***	0.0368***	0.0357***	0.0355***	0.0352***	0.0330***	0.0326***
	[6.395]	[6.093]	[9.224]	[8.443]	[44.20]	[72.92]	[12.91]	[10.86]	[5.321]	[4.853]	[7.097]	[7.562]
Observations	156	151	155	150	139	134	138	133	144	139	143	138
R-squared	0.408	0.429	0.456	0.476	0.199	0.274	0.354	0.422	0.286	0.333	0.349	0.401
S-T multiplier	**0.33**	**0.29**	**0.31**	**0.16**	**0.33**	**0.27**	**0.22**	**0.17**	**0.45**	**0.39**	**0.32**	**0.24**
L-T multiplier	**0.69**	**0.64**	**0.54**	**0.50**	**1.13**	**0.99**	**0.73**	**0.62**	**0.74**	**0.67**	**0.42**	**0.33**

*** p<0.01, ** p<0.05, * p<0.1, t-statistics in brackets

The dependent variable is real non-oil GDP growth. Δ Oil Price is the log difference in oil prices, Inflation is the percentage change in the CPI. See also notes in Table 2.

Source: Country authorities; and IMF staff estimates.

V. CONCLUSION

The debate surrounding the size of fiscal multipliers has been recently re-ignited in the context of the global crisis and the appropriate fiscal policy response to jumpstart global demand. This study provides, in our knowledge, the first set of fiscal multiplier estimates for the GCC countries.

Our results show that fiscal multipliers in the GCC countries are generally relatively weak for current spending but could be sizable (larger than 1) for productive capital spending, despite important leakages through imports and remittances. This is consistent with the recent experience of Saudi Arabia, which managed to shore up economic activity in the non-oil sector during the crisis owing to a large and timely fiscal stimulus targeted at infrastructure and social spending. Table 4 shows that our estimates fall within the range of estimates found in the literature for emerging markets.

Table 4. Summary of Results and Comparison with Literature

Countries	Model	Variables	S-T	L-T 1/
GCC countries this paper	Panel models	total expenditure capital expenditure current expenditure	0.2-0.3 0.2-0.3 0.2-0.4	0.4-0.7 0.6-1.1 0.3-0.7
22 developing countries Ilzetzki, Mendoza, and Végh (2010)	Panel SVAR	Developing countries Fixed exchange rate countries Open economies (exports+imports greater than 60 percent of GDP)	-0.2 0.1 -0.3	0.2 1.5 -0.7
Emerging economies IMF (WEO, 2008)	VARs	total expenditure	0.1-0.2	0
G-20 countries IMF (G-20 note, 2008)		capital expenditure current expenditure	0.5-1.8 0.3-1.0	
Emerging Asia Freedman et al (2008)	Structural model	capital expenditure transfers	0.7 0.4	0.8 0.2

1/ Cumulative over three years.

Macroeconomic stabilization is particularly challenging in the GCC countries given large terms of trade shocks and the lack of an independent monetary policy. In the absence of strong *automatic stabilizers* and a very narrow tax base, *autonomous spending* is the main macroeconomic instrument available to dampen the effect of large oil price swings. This paper shows that despite important leakages, fiscal multipliers for the GCC are not negligible, and in fact are comparable to those for other emerging markets. Therefore, fiscal policy, if carefully calibrated to avoid procyclicality and targeted at productive spending, could be an effective tool for macroeconomic stabilization as well as long-term diversification goals in the GCC region.

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