Economic Commentary

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Saudi Arabia: How Long Will Its Buffers Last If Oil Prices Stay Low?

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1. For all their differences, OPEC countries share the same uncertain outlook: they can hardly insulate their economies from the vagaries of international oil markets. Yet almost all seem to be trying to defy the current oil price collapse by pursuing to varying degrees counter-cyclical economic policies. This is particularly the case of core OPEC countries including Saudi Arabia, the dominant oil player and strong advocate for the policy of defending OPEC's market share, even if that comes at the expense of oil prices – the policy which won out at OPEC's November 2014 meeting.

2. In this context, Saudi Arabia's high reliance on petroleum for export earnings and budget revenues has brought the sustainability of its external and fiscal positions under the spotlight. The external position is straightforward to assess given the country's healthy net foreign assets of over 33 months of imports cover. As far as the fiscal position is concerned, the situation is less clear-cut. The question is not so much whether Saudi Arabia can sustain low oil prices, as it most definitely can. Rather, the question is: how much of a buffer has been built and how long could it last? Although such a buffer should be understood as combining both fiscal surplus and borrowing capacity, we restrict ourselves to the former in order to keep the question as focused as possible.

Up to $750 billion buffer

2. The Saudi budget for 2015, which is a little higher than that for 2014, projects expenditures of $229.3 billion and revenues of $190.7 billion. The resulting deficit of $38.6 billion represents 5% of 2015 GDP (Table 1). Neither the revenue breakdown nor the oil price assumptions underpinning these figures are available. However, what matters here is the expenditure side of the budget, from which we derive a fiscal break-even oil price and thus the time it takes to deplete the country's fiscal buffer for different oil market price assumptions. Before that, however, we must identify the location and size of this buffer.

Table 1: Saudi Arabia's 2014 and 2015 Budgets

US$ billion	2014	2015	%change
Budgeted expenditures	228.0	229.3	0.6%
Actual expenditures [1]	293.3	..	
Revenues	278.9	190.7	-31.6%
Actual/Projected deficit	-14.4	-38.6	
Deficit as % of GDP	1.9%	5.0%	

[1] Including extra-budgetary spending
Source: Saudi Ministry of Finance - %GDP2015 own estimates

3. Saudi Arabia has neither a dedicated sovereign wealth fund (SWF) nor a fiscal stabilization fund (FSF). Instead, the government has trusted its financial surpluses to SAMA. Therefore, in addition to the assets the central bank controls to *inter alia* meet balance of payments financing needs, it also acts as an asset manager for the Saudi treasury. Accordingly, at the end of 2014, SAMA's net foreign assets totaled $724.3 billion and its liabilities in the form of government deposits were $416.2 billion. While the latter aggregate is the most relevant for fiscal operations, it is also the narrowest gauge of the state's fiscal buffer. We have estimated that other autonomous government institutions, including pension funds (PPA and GOSI) and the Public Investment Fund, hold together some $335 billion of assets that could potentially strengthen the fiscal buffer. Therefore, we estimate the broader fiscal buffer to be at least $751.2 billion.

How many years' cover?

4. The calculation of the number of years future deficits could be covered by the fiscal buffer range of $416.2 to $751.2 billion can be approached as the relative difference between the fiscal break-even oil price and the oil market price. The former is a virtual price that balances the budget. This increasingly prevalent concept is as simple to define as it is complex to estimate. As demonstrated in the Appendix to this commentary, it is a function of total budget expenditures; petroleum production, exports, royalty and taxes; non-oil tax revenues; and production costs. These parameters combine to generate a median fiscal break-even oil price of $98.50/bbl. Therefore, assuming 2015 budget expenditures and an OPEC basket's price of $60/bbl – that is to say current market expectations for 2015 – the number of years' budget deficit cover is found to be between 4.6 years for the narrow fiscal buffer (NFB) and 8.4 years for the broader fiscal buffer (BFB) (Table 2).

Table 2: Gap and Years Cover Assuming $60/bbl Market Price

	Budgeted government expenditures (EXP)	Assumed government fiscal surpluses	Fiscal-break-even price (FBP)	Relative difference between FBP and OPEC basket's value	Resulting revenue gap under $60/bbl (ARG)	Years of budget deficit cover (SWF/ARG)
	US$ billion	US$ billion	$/bbl	%	US$ billion	x
Narrow fiscal buffer (NFB)	229.3	416.2	98.5	39.1%	89.6	4.6
Broad fiscal buffer (BFB)	229.3	751.2	98.5	39.1%	89.6	8.4

Source: APICORP Research - Own simulations

5. By definition and construction, the number of years of budget deficit cover is a rational (nonlinear) function of the oil market price whose asymptote is the fiscal break-even oil price. To avoid reaching that asymptote we have restricted the oil price variable (the X-axis) to a maximum of $90 per barrel. As already indicated, the revenue gap can be bridged comfortably under current oil market expectations. More significantly, in the worst-case scenario where oil prices collapse further to $20/bbl (a case envisioned by the Saudi oil minister), the length of the cover is between 2.3 and 4.2 years.

#### Figure 1: Years of Budget Deficit Cover as a Function of Oil Prices
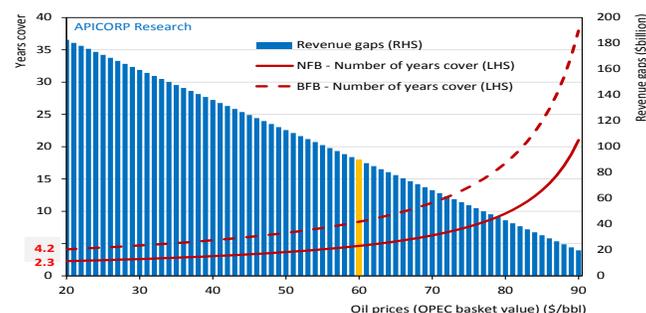
Conclusions

6. Our findings suggest that, *ceteris paribus*, Saudi Arabia can largely afford current fiscal expenditures; in the worst-case scenario for up to four years. When adding other strings to the budget bow, including a large untapped borrowing capacity, the country's fiscal power appears almost inexhaustible. This means that this dominant oil player has indeed the means of its current policy. However, the longer oil prices remain depressed, the more depleted the liquid buffer will be and the more likely it is that efforts to maintain fiscal sustainability will become extremely complicated.

Appendix – Modeling OPEC Fiscal Break-even Oil Prices

A1. In its simplest definition a fiscal breakeven price is the oil price that balances an oil-exporting country's budget. However, as simple as it sounds, its determination involves many different parameters. Production and export volumes are the key determinants of the revenues governments receive from royalty and petroleum taxes. As shown generically in Figure 1, these revenues are complemented by ordinary (non-hydrocarbon) fiscal receipts as well as investment income from financial surpluses managed through a sovereign wealth fund (SWF). All or part of the revenue is spent on public goods through budgetary and extra-budgetary operations, or transferred into a fiscal stabilization fund (FSF).

Figure A1: A Generic OPEC Government's Fiscal Sector
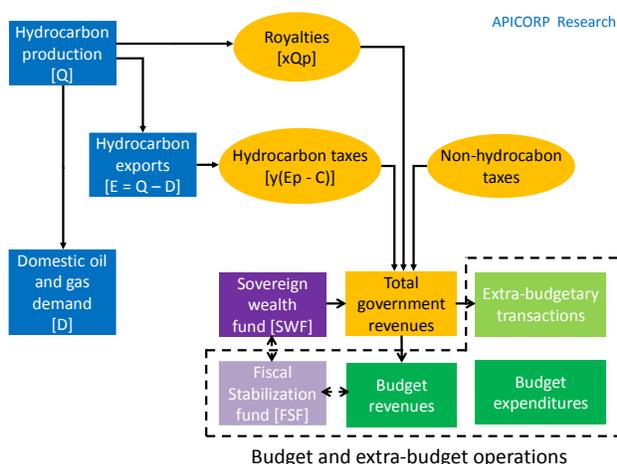
A2. Therefore, our model starts with the identity that government's expenditures should equal hydrocarbon fiscal revenues (HFR) plus ordinary fiscal revenues (OFR) plus any transfer from a SWF or an FSF, as expressed in Equation 1 (box below). For the sake of convenience, royalties collected on the portion of production delivered to the domestic market is calibrated on an export-based opportunity cost. This allows taking the corresponding off-budget implicit energy subsidies out of the model. We have also omitted the exchange rate effect, except for the sensitivity analysis on Iran. It is worth noting in this regard that hydrocarbon exports, from which derive the bulk of fiscal revenues, are generally denominated and paid for in dollars, while government budgets are run in national currencies. Therefore, the exchange rate should not be ignored when its effect on balancing the budget is significant.

A3. Furthermore, assuming SWF returns are re-invested and budgets are balanced (no flows to and from the FSF) leads to limiting budget revenues to hydrocarbon fiscal revenues and ordinary taxes. Accordingly, the break-even price is reduced to a quotient of two elements as expressed in Equation 2. The numerator is the algebraic sum of government expenditures, ordinary fiscal revenues and a tax-based pro-rata share of production costs. The denominator is the sum of royalty/tax-based pro-rata shares of production and exports, respectively. As

the break-even price is expressed in terms of the value of the OPEC basket of crudes, an adjustment factor α is introduced to factor in the differentials between that value and the export prices of relevant products (oil, natural gas and natural gas liquids). In the current market context α has been found to vary from 1 for non-natural gas exporters such as Saudi Arabia, to 0.78 for Algeria and 0.67 for Qatar.

Modeling OPEC Fiscal Break-Even Oil Price (*)

B1. Using the framework described in Figure 1, we derive government budget revenues (GBR) as:

$$GBR = xQ\alpha p + y[E\alpha p - C] + OFR + rSWF + \Delta FSF \quad [1]$$

Where:

- Q is marketed production of hydrocarbons;
- E is hydrocarbon exports;
- C is the hydrocarbon industry's full production cost;
- OFR is ordinary (non-hydrocarbon) fiscal revenues;
- r is the return on SWF;
- SWF is the value of financial assets invested abroad;
- ΔFSF is the flow to and from a fiscal stabilization fund;
- x is hydrocarbon production-weighted royalty rate;
- y is the average rate of hydrocarbon taxation;
- p is a virtual oil price.

B2. Assuming returns from SWFs are re-invested and ignoring, as justified in the text, FSF, we derive the fiscal oil break-even price, from equation 1, as:

$$p = \alpha^{-1} (EXP - OFR + yC)/(xQ + yE) \quad [2]$$

Where:

- EXP is budget and extra-budget expenditures
- α is a price-differential adjustment factor relative to the value of OPEC basket of crudes.

(*) This is an updated version of a model first published in APICORP's *Economic Commentary* dated Sep-Oct 2013: "Modeling OPEC Fiscal Break-even Oil Prices: New Findings and Policy Insights".

A4. Despite these simplifications, feeding the model with the appropriate data remains fairly challenging. Fiscal evidence is tied to the tracking of budget revisions found in supplementary and complementary budgets. They further depend on the degree of transparency of extra-budgetary transactions that prevailing institutional arrangements fail to capture entirely.[1] Just as the difficulty with intermediary data stems from the need to estimate full production costs as well as to calibrate estimates of petroleum royalty and tax rates.

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[1] Richard Allen and Dimitar Radev, "Extrabudgetary Funds", IMF, Technical Notes and Manuals, Fiscal Affairs Department, June 2010.