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External Adjustment in Oil Exporters: The Role of Fiscal Policy and the Exchange Rate

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Abstract

After the decline in oil prices, many oil exporters face the need to improve their external balances. Special characteristics of oil exporters make the exchange rate an ineffective instrument for this purpose and give fiscal policy a sizeable role. These conclusions are supported by regression analysis of the determinants of the current account balance and of the trade balance. The results show little or no relationship with the exchange rate and, especially for the less diversified oil exporters, a strong relationship with the fiscal balance or government spending.

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I. INTRODUCTION

Until 2014, oil exporters enjoyed many years of large current account surpluses, raising questions at the time about whether they were too big from a normative point of view and from the perspective of global imbalances (Beidas Strom and Cashin, 2011; Arezki and Hasanov, 2013). Assessments of current account balances continue to be on the international agenda (IMF, 2016, 2017a). However, after almost four years of oil prices in triple digits, the sharp reduction in the price of a barrel in the second half of 2014 left oil pricess averaging barely $50 in 2015. They have stayed low since and futures prices imply oil will not recover materially over the medium term.

In addition to considerable fiscal strains, oil exporters' external balances are coming under pressure. Many countries are set to register current account deficits. Ability to finance these deficits varies greatly across countries as many have sizeable external wealth but some may face financing difficulties and pressure on reserves (Versailles, 2015). From a normative perspective, exporters of a non-renewable resource should generally be net external savers such that they can finance future imports after the resource is exhausted.[4] Therefore, policy makers in oil exporting countries are considering ways to increase their current account balances. This paper studies how the special characteristics of oil exporters influence the utility of fiscal policy and the exchange rate for achieving this.

A natural tool for external adjustment is the level of the exchange rate.[5] Much of the adjustment is supposed to operate by increasing net exports. Especially in settings where prices are rigid, a weaker currency has the potential to make exports cheaper for foreigners. Similarly, a weaker currency has the potential to make foreign products more expensive and reduce imports through both income and expenditure switching effects.

However, oil exporters have special characteristics that may blunt the effectiveness of the exchange rate as a tool for adjusting the trade balance and hence the current account balance. Following a depreciation, there may be some income compression, but their undiversified economies limit the scope for import substitution and dearer imports would weaken the trade balance. Similarly, with possibly a handful of exceptions, oil producers are price-takers producing at full capacity. As a result, total export volume gains could be negligible although depreciation would raise local-currency prices for exports to a greater extent than for other

[4] This depends greatly on country circumstances, including the level of development, resource-horizon, and existing savings. See Bems and Carvalho Filho (2009) and Araujo, Li, Poplawski-Ribeiro and Zanna (2016).

[5] This paper does not contribute to the debate on the appropriate choice of exchange rate regime. In the literature, the adjustment mechanism can operate regardless of whether nominal exchange rates are fixed or flexible. The benefits of flexible nominal exchange rates in the presence of sticky prices are often attributed to Friedman (1953) – see for example Gervais, Schembri and Suchanek (2016) – although Hanke (2008) argues Friedman often favored fixed rates.

countries. In some cases, net remittance outflows could rise due to limited substitution between nationals and migrants.

In contrast, fiscal policy could play an important role in external adjustment in oil exporters.[6] As is generally the case, fiscal and external balances are linked in the absence of full Ricardian equivalence. In particular, lower government spending likely reduces imports and remittance outflows and could also reduce exports and net investment income inflows over time. For oil exporters, the government plays a large role in an economy that is on average more import dependent than in other countries, which suggests that government expenditure decisions could have a larger bearing on the current account than in other economies.

We evaluate these claims by econometrically comparing the relative importance of the exchange rate and fiscal policy in adjusting the trade balance and the current account. Specifically, we regress the current account balance on the exchange rate and on fiscal policy variables. The results show that the exchange rate has little or no effect on the current account balance but that fiscal policy has a sizeable impact in highly undiversified oil exporters. In regressions where the trade balance is the dependent variable, we find similar results, namely that the effect of fiscal policy is strong and the effect of exchange rates is weak. The value of the currency tends to have a marginally stronger effect on the trade balance than the current account balance and government spending has a slightly stronger impact on the current account than the trade balance.

Our analysis builds on existing empirical work on current account determinants in oil exporters (Beidas-Strom and Cashin, 2011; Arezki and Hasanov 2013, Morsy, 2009) and broader groups of countries,[7] which help assess the appropriate size of a current account. We emphasise government spending, not just the fiscal balance, in order to isolate this policy tool from mechanical revenue/export links driven by oil receipts. Existing studies include exchange rates as control variables in some cases but do not discuss them at length, possibly because the coefficients were not robustly negative. We directly discuss the small or insignificant effects found here and why they make sense for oil exporters. Moreover, we distinguish between a relatively broad group of oil exporters and a narrower subset of more oil-dependent economies.

To our knowledge, this is the first paper to produce reduced-form trade balance regressions for oil exporters. Even for wider sets of countries, regressions of the trade balance are scarce.

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[6] Fiscal and exchange rate policy are of course not mutually exclusive. Both instruments could be used simultaneously. Moreover, the two have the potential to interact: in principle, fiscal restraint can aid real exchange rate depreciation by containing domestic prices. A weaker currency can potentially improve the fiscal balance by increasing local-currency oil revenues and by reducing the share of government spending in nominal GDP. Nonetheless, the arguments above suggest a larger role for fiscal policy.

[7] Examples include Phillips and others (2013), Abbas and others (2011), Calderon and others (2002), Gosse and Serranito (2014), and Ollivaud and Schwellnus (2013).

Ollivaud and Schwellnus (2013) employ single-equation estimation for only a handful of countries. Our paper thus fills a sizeable gap between reduced-form current account balance regressions and a related literature on structural trade equation estimates. For a broad group of countries, Leigh, Lian, Poplawski-Ribeiro, and Tsyrennikov (2015)[8] estimate the responses of relative prices to exchange rate changes and in turn the responses of import or export volumes to relative prices; they argue that exchange rate changes could have a big impact on real net exports. Studies that disaggregate across products or trading partners find higher exchange rate effects (Auer and Sauré, 2012; Imbs and Mejean, 2015). For oil exporters, Hakura and Billmeier (2008) conduct a similar aggregate analysis to Leigh and others (ibid), finding in contrast that import and export volume responses to exchange rate changes are negligible.

One important advantage of the reduced-form approach to estimating the trade balance or current account is that it implicitly incorporates potential income effects from exchange rate changes as well as channels that may not have been explicitly identified in addition to the expenditure-switching effects emphasized in the theoretical literature. A second advantage is a more straightforward comparison of sensitivity to exchange rate and fiscal variables.

Our paper proceeds as follows. Section II elaborates on the potential channels through which exchange rates and fiscal policy could affect the trade balance and other items in the current account. Although the existing empirical evidence supports a role for both in general, we describe the special characteristics of oil exporters that undermine the role of the exchange rate (using adapted Marshall Lerner conditions) and amplify the role of fiscal policy (with an adapted textbook Keynesian cross model).

Section III discusses the empirical results. We base our econometric work on an annual panel data set from 1986 to 2014. Our broad sample of oil exporters has 24 countries, but we also have a restricted sample of 15 more oil-dependent countries. Regressions on the broad sample suggest a 1 percent depreciation raises the current account by about 0.05 percentage points of GDP, although many specifications are statistically non-significant or positive. This is lower than found in the literature for other countries. For the restricted sample, the response could be even smaller. The regressions also suggest that depreciations have a marginally larger impact on the trade balance than the current account balance. For example, a 1 percent depreciation would raise the trade balance by 0.06 percentage points of GDP in the broad sample. The regressions show a strong association between external adjustment and fiscal policy in highly oil-dependent countries. In particular, the estimated elasticity of the current account balance to government spending is around 1.2 for the restricted sample and the trade balance elasticity is around 0.7. For the broader sample, the elasticity of the trade or current account balance with respect to government spending is up to 0.2, which is closer to that found for other countries.

[8] Also see Leigh, Lian, Poplawski-Ribeiro, Szymanski, Tsyrennikov and Yang (2017).

Section IV concludes and suggests potential future research including the extension of the empirical work to other commodity exporters.

II. THEORETICAL CHANNELS AND EXISTING RELEVANT LITERATURE

This section will argue that special characteristics of oil exporters reduce the impact of the exchange rate on the trade balance and more generally the current account, while suggesting that the link between fiscal policy and external balances could be stronger in at least some oil exporters.

A. The Role of the Exchange Rate

The exchange rate and trade volumes

In many diversified economies, the exchange rate has the potential to affect net export volumes. In open economy macroeconomic models, the main channel through which the exchange rate affects trade is expenditure switching (Obstfeld and Rogoff, 1996; 2007; Gervais and others, 2016). For example, a fall in the nominal value of the currency will make imports expensive relative to domestic goods and reduce imports. Imports may also decline due to a fall in real incomes. Currency depreciation will also make exports of traditional goods cheaper for the rest of the world and/or raise the price received by exporters, stimulating exports.

Volume effects depend on the transmission from exchange rates to relative prices and from relative prices to trade volumes. First, pass-through from exchange rates to relative prices across countries depends on the extent of producer-currency pricing. Nominal prices are often assumed to be fixed in the producers' currencies so prices for consumers change one for one with changes in the nominal exchange rate (Bayoumi and Faruqee, 1998). So, following a depreciation in a country, this assumption implies that country's import prices in local-currency increase proportionally with the exchange rate while that country's export prices in local currency remain unchanged (becoming cheaper in foreign currency).[9] However, empirical studies typically find incomplete pass-through of exchange rate changes to international prices. (Goldberg and Campa, 2010; Leigh and others, 2015).

Second, in addition to the export price, an important assumption is that domestic prices do not rise in proportion. Exchange rate pass through to domestic prices can increase exporters' input costs (Amiti et al., 2014), which may lead to a mark-up by the exporter. There is some evidence that countries with a low share of domestic value added have lower export responses to exchange rate changes (Ahmed, Appendino, and Ruta, 2015).

[9] The opposite extreme is consumer-currency pricing or pricing-to-market, where exchange rate changes do not change relative prices so a country's exports would not be cheaper on global markets following depreciation (nor would its imports become more expensive).

The third influence on volume effects is the extent to which the value of the exporter's currency will make exporter's goods cheaper for foreigners, which will stimulate foreigners' demand for the exporter's products.[10] The size of the effect will depend on the slope of the demand curve. Analogously, to the extent that a depreciation makes imports more expensive, importers may switch to domestic substitutes – to the extent available – and face real income declines, which would reduce import volumes.

Oil exporters have a number of special features that limit the effect of the exchange rate on trade volumes (Tables 1 and 2). First, to varying degrees, there is no tradable sector other than oil and gas. Importantly, the price of oil is set in US dollars internationally and most producers face a perfectly elastic demand curve. Consistent with this, Hakura and Billmeier (2008) find exchange rate changes in an oil exporter translate fully to changes in domestic-currency prices. Most countries have no pricing power and produce this undifferentiated product at full capacity. Moreover, domestic prices are below international pre-tax levels in many countries oil exports require limited inputs.

The second special feature of oil exporters is that non-oil goods and services contribute a small share to the export basket. Therefore, it would take an unrealistically large change in their value to have a meaningful impact on the current account balance, especially in less diversified exporters. Hakura and Billmeier (2008) find the long-run non-oil export volume elasticity with respect to relative prices for oil exporters is -0.67, which is similar to the canonical estimate for other countries' total or manufacturing exports. However, consistent with the non-response of (dominant) oil export volumes, the elasticity for oil exporters' total (oil+non-oil) exports is insignificantly different from zero.

The third special feature is that many oil exporters have undiversified economies with minimal opportunity for expenditure switching between imports and domestic production or between tradables and non-tradables. A weaker currency could reduce imports through an income effect, but the relative importance of smoother government spending in oil exporters would tend to make income effects smaller than in other countries. Hakura & Billmeier (2008) find the long run elasticity of imports with respect to the exchange rate for oil exporters in the Middle East and Central Asia is 0.09, which is insignificantly different from zero and well below estimates for broader country groupings.

Labor market characteristics likely reduce the scope for competitiveness gains in some oil exporters. Some countries employ elastically supplied international labor. Analogous to countries that use commodities purchased at international prices as inputs into the production of exports, wages from migrants – often employed on short-term contracts - would stay at international levels. Depreciation would necessitate a rise in the local currency wage, cancelling out any cost advantages. In many of those countries, a large proportion of nationals work in the public sector, which is used as a wealth-sharing mechanism. This

[10] It could also increase the incentive to export by raising the local-currency price received for tradable products relative to non-tradable products.

makes reservation wages for nationals in the private sector so high that it would take a very large devaluation for firms to become competitive.

Other channels could also act to amplify or dampen the expenditure switching effect. As mentioned earlier, it is intuitive that a weaker currency has the potential to reduce real income or wealth and hence imports. In contrast, traditional elasticities-absorption models show weaker currencies can increase output, which raises imports and hence mitigates the effect of the exchange rate on the current account. Incorporating intertemporal features can preserve or rule out income and wealth channels, depending on the specified microfoundations (Isard, 1995; Sarno and Taylor, 2002).

The trade balance: competing volume and price effects

The sign of the impact of the exchange rate on the trade balance is theoretically ambiguous. Depreciation only improves the trade balance if the volume effects (the lower import quantities and higher export volumes discussed above) outweigh the price effects (paying more for imports and receiving less for some exports). Formally, this has been referred to as the Marshall Lerner conditions.[11] Price effects are immediate[12] and potential volume effects typically have a lag, so depreciation is more likely to have a smaller or negative effect on the trade balance in the short run, potentially resulting in the so-called J-curve (Dornbusch and Krugman, 1976).

Marshall Lerner conditions were found to hold in the short run and in the long run for much but not all of a broad sample of countries studied by Leigh and others (2015). Our calculations based on their reported results suggest a 10 percent depreciation would on average improve the local-currency trade balance as a share of GDP by about 8 percent in the long run. This is close to reduced form trade balance regressions for the OECD, which have elasticities reaching -0.06 (Ollivaud and Schwellnus, 2013). Bayoumi and Faruqee (1998) found the short run condition fails marginally but the long-run condition holds, which is consistent with the J-curve, although Rose and Yellen (1989) do not find support for the J-curve. These studies draw on country-level series, where responses are typically lower than those using data that is disaggregated at the product/sector level (Orcutt, 1950; Auer and Sauré, 2012; Imbs and Mejean, 2015).

For oil exporters, the volume elasticities discussed above make it less likely that the Marshall Lerner conditions hold, but there is an important effect from US-dollar pricing of oil. To compare price and volume impacts in more detail, we derive the semi-elasticity of the local currency trade balance as a share of GDP with respect to the exchange rate for oil exporters.

[11] The canonical variant of this condition is that the sum of the absolute values of import and export volume elasticities must exceed unity.

[12] Bonadio, Fischer and Sauré (2016) present evidence that price adjustment starts the second working day after the exchange rate shock.

As a point of departure, $\frac{TB}{GDP} \equiv \frac{O}{GDP} + \frac{N}{GDP} - \frac{M}{GDP}$. *TB* is the trade balance; *GDP* is gross domestic product; capital letters O, N, and M are nominal values of oil exports, non-oil exports, and total imports. Splitting nominal values into volumes and prices and applying corresponding lower case letters, $\frac{TB}{GDP} \equiv \frac{op^o}{GDP} + \frac{np^n}{GDP} - \frac{mp^m}{GDP}$. Let E capture the exchange rate as the ratio of foreign to domestic currency such that a rise in E implies an appreciation for the oil exporter. Holding the effects of exchange rate on GDP constant, the derivative can be written as:

$$\frac{\partial TB}{GDP}\Big/_{\partial E} = \left(\frac{\partial o}{\partial E}\right)\frac{p^o}{GDP} + \left(\frac{\partial p^o}{\partial E}\right)\frac{o}{GDP} + \left(\frac{\partial n}{\partial E}\right)\frac{p^n}{GDP} + \left(\frac{\partial p^n}{\partial E}\right)\frac{n}{GDP} - \left[\left(\frac{\partial m}{\partial E}\right)\frac{p^m}{GDP} + \left(\frac{\partial p^m}{\partial E}\right)\frac{m}{GDP}\right]$$

Converting the derivative to a semi-elasticity and adding the same terms to the numerator and denominator yields:

$$\frac{\partial TB}{GDP}\Big/_{\frac{\partial E}{E}} = \left(\frac{E\partial o}{\partial Eo}\right)\frac{op^o}{GDP} + \left(\frac{E\partial p^o}{\partial Ep^o}\right)\frac{op^o}{GDP} + \left(\frac{E\partial n}{\partial En}\right)\frac{np^n}{GDP} + \left(\frac{E\partial p^n}{\partial Ep^n}\right)\frac{np^n}{GDP} - \left[\left(\frac{E\partial m}{\partial Em}\right)\frac{mp^m}{GDP} + \left(\frac{E\partial p^m}{\partial Ep^m}\right)\frac{mp^m}{GDP}\right]$$

Consistent with the earlier discussion, we can assume the elasticity of oil prices to exchange rates is -1 (an appreciation proportionally reduces local currency oil receipts). Similarly, because imports are priced in dollars, the import price elasticity is also -1. We assume non-oil exports are priced in local currency so there is no price effect.[13] With these assumptions for price elasticities, and denoting the volume elasticities by η,we have a simplified expression again expressed using nominal values:

[13] As discussed earlier, the assumptions for oil exports and imports are consistent with Hakura and Billmeier (2008). For non-oil exports, this is a standard assumption made for simplicity; allowing for their estimated imperfect pass-through has a marginal net impact on the results.

$$\frac{\partial TB}{GDP}\Big/\frac{\partial E}{E} = (-1+\eta^{o})\frac{O}{GDP} + (0+\eta^{n})\frac{N}{GDP} - (-1+\eta^{m})\frac{M}{GDP} \quad (1)$$

We draw empirical volume elasticity estimates for oil exporters from Table 2. For example, we take the import coefficient of 0.09.[14] Table 2 does not have a specific coefficient for oil exporters but a volume effect of 0 for oil exports is reasonable given that total exports have a coefficient of 0.13, which in any case is insignificant. Substituting in these values, together with the non-oil export elasticity of -0.67, yields an equation that combines price and volume effects:

$$\frac{\partial TB}{GDP}\Big/\frac{\partial E}{E} = -\frac{O}{GDP} - 0.67\frac{N}{GDP} - (-0.91)\frac{M}{GDP} \quad (2)$$

The derivative can be positive or negative, depending on the relative values of *O*, *N* and *M*. An appreciation would increase the trade balance because the small increase in import volumes is substantially outweighed by the decrease in import prices. This is also the case for a broader sample of countries but the coefficient on import values of -0.91 is much higher than for other countries. This is the main reason why exchange rate changes have less of an effect on oil exporters' trade balances. [15]

The broader current account: other exchange rate channels and empirical literature

The exchange rate could affect investment flows.[16] Fixed income obligations in foreign currency would be affected by exchange rate changes. Anticipation of future depreciation could also raise the required returns, consistent with interest-parity conditions. Holding dividend outflows in local-currency constant, currency movements would have no effect on the current account in domestic currency terms. However, the impact on local-currency outflows need not be constant and could depend on where the underlying profits were

[14] Because it is insignificantly different from zero, the authors choose to use 0 for their subsequent analysis. However, the import volume coefficient could be higher for a broader sample of less oil-dependent countries, and the estimates could be subject to the downward aggregation bias associated with macroeconomic estimation (Imbs and Mejean, 2015) and to measurement error.

[15] Taking the coefficients for oil and non-oil exports together, the net result is not necessarily dissimilar to that for other countries, although more of the impact will be from oil export prices than non-oil export volumes. The derivative for the overall trade balance is sensitive to the price of oil because the contribution from oil exports is higher when the oil price is higher.

[16] Compared to trade balance channels, published work on these channels appears to be rare.

generated or what the source of income is. For example, if a depreciation raises local-currency profits in the oil sector, local-currency dividend outflows could rise.

A depreciation could increase remittance outflows in domestic currency terms. As reservation wages for migrants are set internationally, a weaker currency would increase local currency wages. To the extent that labor markets are segmented, changes in relative prices would likely not induce much substitution between foreign workers and nationals. These conditions are analogous to imports of goods and services in that the price/wage effects would likely substantially outweigh the volume/employment effects.

Studies on broad samples of countries tend to find a negative relationship between the exchange rate and the current account. Gosse and Serranito (2014) estimate a long-run elasticity of -0.1 for OECD countries, while Calderon et al (2002) have a (long-run) estimate of -0.13 for a broader sample. In Gervais and others (2016), the median of 16 emerging market countries' estimates is -0.09. These estimates are close to but above those for the trade balance discussed earlier. Concentrating on the Middle East, Beidas-Strom and Cashin (2011) find that oil-importing emerging markets have an elasticity of -0.09. However, they estimate a positive relationship between the exchange rate and the current account in Middle East oil exporters, which on average are less diversified than oil exporters in other regions. Estimates in Arezki and Hasanov (2013) for 21 global oil exporters average approximately -0.04, although they found similarly low elasticities for their sample of non-oil exporters.

B. The Role of Fiscal Policy

There are clear links between fiscal and external balances. In all countries, the current account balance reflects national saving. As per the national accounts identity: $\text{Current account balance} \equiv \text{Saving} - \text{Investment} = (\text{Saving} - \text{Investment})\_\text{public} + (\text{Saving} - \text{Investment})\_\text{private}$. Given the important role of the government, its reliance on exported oil for revenue, and the high share of imports in domestic expenditure, there is a close relationship between the current account balance and the fiscal balance in oil exporters. This channel only operates if full Ricardian equivalence does not hold such that a rise in government dissaving is not completely offset by additional private sector saving. Moreover, if the private and public sectors are positively correlated, then the change in the current account balance can exceed the change in government dissaving. This would represent a departure from standard models but could in practice arise from the data if the "private" sector includes public enterprises, government related entities, or private firms who borrow in order to supply the government.

Government spending raises imports by stimulating economic activity and incomes. The link could be stronger when government plays an important role in the economy. For example, spending on wages and salaries provides the means for public employees to import both food and Ferraris. Government spending can also be incurred directly on imports - capital spending likely has a large import component - or on services like hired consultants.

Government spending can also discourage exports, although the channel is less established than for imports. Public spending can skew incentives away from export-oriented industries because much of the domestic demand it generates is in non-tradable sectors. This makes producing non-tradables less risky and more profitable for firms. The continued availability of public sector jobs discourages nationals from pursuing entrepreneurship and private sector employment including in tradable sectors (Behar and Mok, 2013; Cherif and Hasanov, 2014).

To illustrate the trade balance mechanics using the simplest algebra possible, consider a variant of the standard textbook Keynesian cross model.

$$Y = C + G + X - M$$

C=cY, M=m(C+G), X=X˜-xG; c,x and m are all between 0 and 1 (strictly in the case of c).

Y is GDP, *C* is consumption, which is a constant proportion of GDP. (We exclude private investment as this has no bearing on the results.) *G* is government spending on consumption and investment. *X* is exports and is made to vary negatively with government spending. *M* is imports, which is a constant proportion of both private consumption and government spending.[17] The government spending multiplier is

$$\frac{\Delta Y}{\Delta G} = \frac{1 - x - m}{1 - c(1 - m)} \qquad (3)$$

and the change in the trade balance following a change in government spending, the government trade balance multiplier, is:

$$\frac{\Delta(X - M)}{\Delta G} = -\left[m + x + mc\frac{\Delta Y}{\Delta G}\right] = -\left[\frac{m + x(1 - c)}{1 - c(1 - m)}\right] \qquad (4)$$

It is straightforward to show that the impact of government spending on the trade balance is negative, and that the impact is greater for larger values of x or m. Intuitively, the government trade balance multiplier is bigger if the marginal propensity to import is large (as is expected in less diversified economies) and if the impact of government spending on exports is large. In particular, the absolute value of the government trade balance multiplier exceeds 1 if x+m>1. It has an asymptotic maximum of 2 when x=m=1 and when c is asymptotically close to 0, although c is likely much closer to 1. Without the exports channel (x=0), the maximum is 1, but it is quite feasible to generate values that are close. For example, setting (x,m,c)=(0,0.65,0.8) generates a government spending multiplier of 0.6 and a trade balance multiplier of -0.88.

[17] This departure from standard textbook treatments is realistic and necessary to make it possible for the fiscal multiplier to be less than 1, as is commonly found for oil exporters (Espinoza & Senhadji, 2011; Cerisola, Abdallah, Davies and Fischer, 2015), absent introducing financial channels (like crowding out effects on private investment) or a supply-side to the model.

There can be additional non-trade effects of government spending on the current account if some of the resulting expansion in GDP is attributable to foreign labor and capital. Expatriate employment is responsive to economic activity (Behar, 2016), which in turn is correlated with government spending (Espinoza & Senhadji, 2011; Cerisola and others, 2015), so remittance outflows are likely positively correlated with government spending. Other things equal, higher government spending reduces net saving / increases net borrowing. In turn, this reduces net income inflows / raises net income outflows over time. Government spending can also have second-round effects if it leads to lower confidence, higher risk premia, and hence higher interest payments (Baldacci, Gupta and Mati, 2011). Returning to the arithmetic illustration of the fiscal (0.6) and trade balance (-0.88) multipliers, one needs only assign a modest role for foreign labor and capital in the domestic output expansion to attain a current account elasticity exceeding |1|.

Existing evidence suggests a significant relationship between fiscal policy and the current account. Estimates in Abbas and others (2011) suggest a long-run response of the current account to the fiscal balance averaging about 0.45 in 88 non-oil-exporting countries. Regressions underpinning IMF External Balance Assessments in a selective sample of about 50 countries yield an elasticity estimate of about 0.3 (Phillips and others, 2013), which excludes countries that are highly oil dependent, small, or have poor data quality or insufficient access to global capital markets. The IMF's EBA-Lite template for a sample of 150 countries has a coefficient of about 0.5 (Chen, 2016). For a handful of countries, Ollivaud and Schwellnus (2013) estimate a range of elasticities of the current account balance with respect to the fiscal balance averaging about 0.45. Gosse and Serranito (2014) however estimate a much lower range including their preferred elasticity of only 0.11. A similarly low value (0.14) is estimated for oil-importing emerging markets in the Middle East by Beidas-Strom and Cashin (2011), who find a substantially higher coefficient of 1.3 for the region's oil exporters. Similarly, Arezki and Hasanov (2013) have estimates averaging 0.9 for a broader sample of 21 oil exporters and averaging only 0.3 for a global sample of 115 countries. They estimate a similarly large negative response of the current account to government spending in oil exporters of about -1.1.

III. EMPIRICAL SECTION

The previous section drew on analytical frameworks and existing literature to argue that the impact of fiscal policy including government spending on the external accounts should be higher in oil exporters than in other countries and that the effects of the exchange rate should be small. This section estimates the role of the exchange rate and fiscal variables econometrically.

A. Sample selection and preliminary discussion

The starting point for our sample of oil exporters is 24 countries selected from the World Economic Outlook list of 29 oil exporting countries.[18] To narrow the sample to countries with strong reliance on oil, we set a benchmark of 70 percent of oil exports in the total of exports of goods and services. This more restricted selection procedure yields a subsample of 13 countries to which we add Bahrain and the United Arab Emirates (UAE) in order to have all the GCC countries. Our 'restricted sample' of more oil-dependent economies therefore consists of 15 oil exporters (appendix table 1). The sample consists of annual data from 1986-2014.

Before turning to the regressions analysis, figure 1 provides a set of charts showing the evolution of some macroeconomic indicators for the two country-groups, namely simple averages for the broad sample and the restricted sample, over the past two decades. The charts evidence that the more oil-dependent oil exporting countries have on average larger current account and trade balances than the broad sample. The difference in terms of imports is less straightforward between the two samples over the covered period. Fiscal balances and government spending are higher on average for the restricted sample of oil exporters compared to the full sample

Figure 1 also provides some preliminary insights regarding the relation between exchange rate, fiscal and external adjustments, in line with our discussion in the previous section. The charts suggest a clear positive correlation between the fiscal balance and the current account or trade balance. For much of the sample period, public saving accounts for at least half of national saving. Government spending appears to be negatively correlated with both trade and current account positions. This is consistent with the positive correlation between government spending and imports.

When looking at the exchange rate path, whether there is clear correlation with the external balances (current account and trade) is much less straightforward to determine. Nonetheless, despite many oil exporters having fixed exchange rates,[19] there is considerable variation over the sample period. The average of each country's coefficient of variation is 0.28 in the broad sample and 0.27 in the restricted sample – implying no difference across the groups.[20] On

[18] Brunei Darussalam, Iraq, Timor-Leste, and Turkmenistan are excluded because of missing data. The remaining 25 countries are sorted based on the share of oil exports in the total exports of goods and services (average over the estimation period). On this criterion, Bolivia is excluded as the average ratio (3.3 percent) is much lower compared to the rest of the sample (30 percent or more).

[19] According to the 2014 IMF Annual Report on Exchange Arrangements and Exchange Restrictions, half of our sample is classified within pegged exchange rate regimes. The rest follow other strategies, including stabilized arrangement, managed float, or floating regimes.

[20] Data available on request shows there was also considerable variation across oil exporters. Since mid-2014, oil exporters remaining pegged to the dollar have continued to experience appreciation alongside the US

(continued…)

average, the appreciation since the mid-2000s coincided with a large and sustained increase in the real oil price.

B. Current account balance regressions

Model specification

The equation to be estimated can take the following form:

$$CAB_{it} = \gamma + X_{it}\Phi + \beta REER_{it} + \varphi fiscal_{it} + \alpha_i + \varepsilon_{it} \qquad (5)$$

Where *CAB* is the current account balance expressed as share of GDP, *REER* is the log of real effective exchange rate index normalized to 100, *fiscal* stands for fiscal variables (fiscal balance or government spending and revenue, as a share of GDP), and the α represents the countries' fixed effects. *i* and *t* indicate country and time dimensions, respectively. *X* is the vector of additional variables which control for the main determinants of the current account balance.

Our primary interest in this empirical analysis is in the following two variables:

Real effective exchange rate. As discussed earlier, exchange rate changes can affect the current account balance quite substantially, although we suspect a relatively lower impact in the case of oil exporters. For robustness, we also present some regressions where we assess the effect of the *nominal effective exchange rate*.

Fiscal policy / government spending. The discussion in section II suggests that the response of the current account balance to the fiscal stance is likely to be stronger in oil exporting countries, but also compared to the response to exchange rate changes. We control for the fiscal position in different ways:

- The general government *Fiscal balance* as a share of GDP.
- *Government spending,* with Government revenue included separately as a control variable (both as a share of GDP). The latter approach differs from the existing literature (with the notable exception of Arezki and Hasanov, 2013). Our specification allows disentangling the impact of government spending decisions from the actual effect of oil prices on fiscal revenue and exports. This emphasis is important from a policy perspective because government spending is the main lever of fiscal policy and non-oil revenues currently play only a limited role. Because the revenue variable includes oil

currency despite the plunge in the oil price. Others have devalued or moved to more flexible regimes. Those oil exporters who had more flexible exchange rates have recently experienced depreciations.

price effects, we choose not to interpret the coefficient of revenue as the effect of discretionary government revenue decisions on the current account. [21]

- *Government revenue* also separately controls for a key input into government spending decisions and thus alleviates an important source of endogeneity that would otherwise overestimate the effects of government spending (or fiscal policy): government revenue captures variation in oil revenues in a country-specific way, unlike the oil price, and thus allows for a cleaner identification of the effects of government spending.

- *Non-oil fiscal balance* and *non-oil current account.* Instead of controlling for oil revenue changes, we also consider excluding oil exports from the current account and oil revenues from the fiscal balance.

The controls are in line with existing studies on the determinants of the current account balance for oil exporting countries (Arezki and Hasanov, 2013; Beidas-Strom and Cashin, 2011; Morsy, 2009, among others). The following controls are included in the current account balance regressions:[22]

Net foreign assets (NFA). Countries with a more positive NFA position can afford running larger external trade deficits without jeopardizing their external solvency and remaining insulated from current account crises. In such a context, NFA can be expected to deteriorate the current account balance. However, higher NFA is also expected to increase income flows from abroad, leading to an improvement of the current account position. Although the total impact may depend on the importance of these two forces, existing empirical tests suggest that the latter positive effect on the current account is stronger.

Commodity terms of trade. A positive terms of trade shock, ceteris paribus, is expected to improve the current account balance through increases in exports receipts. As this effect is likely to be dependent on the degree of a country's openness, the terms of trade index is interacted with *Trade openness*.

GDP growth (forecast in 5 years). This variable aims at capturing the underlying growth potential. Rapid growth in economic activity may require higher foreign-financing investments and/or a depletion of national saving. This in turn is likely to deteriorate the current account balance.

Dependency ratio. A higher proportion of dependents (inactive) as a share of the total active population is expected to be negatively correlated with national saving. Such deterioration of gross saving is likely to translate into a deterioration of the current account balance.

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[21] The results presented do not include time dummies, but, results available on request are robust to the inclusion of time fixed effects, which would be a more flexible way to control for the oil price. In particular, the dummies can help control for the simultaneous increase in the value of oil and many oil-exporter currencies in final third of our sample. Moreover, the terms-of-trade control variable also captures oil price changes to some extent in a country-specific way.

[22] A correlation table between our variables of interest is provided in appendix table 3.

Relative output per worker. The relative output per worker intends to capture different productivity levels in the country sample. Highly productive economies can to be more competitive on international markets and register stronger trade balance positions. Traditional approaches on current account also reflect the theory that capital will flow from higher to lower productivity economies. The extent of capital flight is likely to depend on the country's capital openness. Therefore, the relative output per worker is interacted with the *Capital control index*.

Demeaned private credit to GDP. An increase in credit to the private sector can boost aggregate demand, leading simultaneously to a deterioration of the current account and real appreciation. The private credit to GDP ratio aims at capturing the effect of financial excesses, which may also reflect policy failures to contain them. This variable is generated as a deviation from the historical average for each country.

Aid to GDP. Aid flows to recipient countries may also contribute to fuel domestic demand for imports, with negative effects on the current account balance. This is particularly relevant for low income and emerging countries included in our sample.[23]

Oil resource temporariness. For net oil exporters, natural resource wealth can allow sustaining relatively persistent current account deficit (or lower current account surplus). However, those countries may be inclined to save a higher proportion of this resource wealth (including for inter-generational purpose) as the oil resource tends to exhaust. Therefore, the temporariness of the oil resource is expected to be positively correlated with the current account balance.

Regarding the estimation procedures, three alternative approaches are implemented.

- OLS panel Fixed Effects approach. This method has the advantage of controlling for countries' specific time-invariant characteristics not taken into account by the control variables included in the empirical framework.

- Generalized Least Squares (GLS) with panel-wide AR(1) correction to take account of the fact that current account data display strong autocorrelation. This approach is employed in Phillips, Catão, Ricci, Bems, Das, Di Giovanni, Unsal, Castillo, Lee, Rodriguez, and Vargas (2013).

- GMM-system estimator (Blundell and Bond, 1998). While considering a dynamic specification, GMM-system aims at addressing the potential endogeneity bias surrounding the two first approaches. Besides the bias due to the introduction of the lagged dependent variable among the regressors, there may be reverse causality, especially between exchange rates and external balances. Depending on the source of the bias, this can lead to over- or under-estimation of the beneficial effects of exchange rates. Given the limited availability of external instruments for all potential endogenous

[23] For some of those countries, aid flows have been relatively important, exceeding 10 percent of GDP (Republic of Congo and Equatorial Guinea until the 1990s, for example).

variables, GMM-system relies on an internal instrumentation procedure where the lags of the regressors are used as instruments. GMM-system has been designed for panels with a small time dimension compared to the numbers of individuals (Roodman, 2009). Given the initial structure of our panel, the implementation in this paper relies on 4-year averages to reduce the time dimension relative to the number of countries.[24] However, especially for the restricted sample, this ratio may still be too high, calling for caution when interpreting the results.

Estimation results

Table 3 presents the results of current account regressions for the full and the restricted samples, considering specifications where we control for the fiscal balance as well as government spending and revenue separately. Most of the control variables are found to have the expected and statistically significant effect on the current account balance.

Regarding the current account response to real exchange rate changes, our findings evidence a relatively low and/or statistically insignificant effect, depending on the country group and the model specification. At most, the results suggest that a 1 percent currency depreciation will improve the current account balance by about 0.05 percentage points (pp.) of GDP. Some specifications show a much lower or statistically insignificant response (column 11 suggests a current account improvement of about 0.03 pp. of GDP in response to a 1 percent currency depreciation for the restricted sample). The positive and statistically significant coefficients of columns 4 (suggesting that currency depreciation may deteriorate the current account balance) are very low.

The fiscal balance has generally a positive and robust impact on the current account balance. However, the current account response to changes in the fiscal position is significantly different across country groups. Considering the broad sample of oil exporting countries, the range of findings suggests that a 1 pp. increase in fiscal balance will improve the current account position by up to 0.3 pp. of GDP. This response is much higher for the restricted sample. Columns (4) through (6) suggest that a 1 pp. increase in the fiscal balance for the restricted sample will increase the current account balance by about 1.1 pp. of GDP.

When investigating separately the role of government spending, it does not seem to make a significant difference for the full sample (compared to the impact of the fiscal balance), while the current account response to government spending appears to be somewhat stronger for the more oil-dependent oil exporters. A 1 pp. increase in government spending deteriorates the current account position by up to 0.2 pp. of GDP for the broad sample of oil exporting

[24] The choice of 4-year averages is guided by a trade-off between keeping the ratio of time periods to countries sufficiently small (to aid reliability of the system-GMM estimator) and the total observations sufficiently large. Results available on request show the findings are unchanged with alternative approaches (for example, 5-years averages), although the number of observations is significantly lower in the restricted sample.

countries, and by 1.2 pp. for the restricted sample. The findings for both samples support the argument that the correlation between the fiscal balance and the current account balance is not only mechanically through oil revenues but also because of government policy.

C. Trade balance regressions

The trade balance equation to be estimated takes the following form:

$$TB_{it} = \gamma + Z_{it}\Omega + \delta REER_{it} + \varphi fiscal_{it} + \alpha_i + \upsilon_{it} \quad (6)$$

Where *TB* is the trade balance, *Z* is the set of factors assumed to be the main determinants of the trade balance, the α are the country fixed effects, and υ is the error term.

Table 4 presents the results of trade balance regressions for the full and the restricted samples. Most of the control variables appear to affect the trade balance as expected.

The results suggest little sensitivity of the trade balance to exchange rate changes. Considering the broad sample, a 1 percent currency depreciation is expected to improve the trade balance by about 0.06 pp. of GDP. This effect is lower in magnitude (0.04 pp.) or insignificant for the restricted sample. The trade balance response to exchange rate is slightly stronger in magnitude (more negative) compared to the current account response for both the full and the restricted samples. The results are consistent with the earlier discussion of the potentially negative effects of currency depreciation on the current account through income outflows.

The trade balance response to changes in the fiscal balance is found to be high in the restricted sample. A 1 pp. increase in the fiscal balance is expected to increase the trade balance by about 0.2 pp for the full sample. The response is significantly higher when focusing on the restricted sample, as a 1 pp. increase in fiscal balances will increase trade balance by around 0.7 pp. of GDP. A 1 pp. increase in government spending deteriorates the trade balance by about 0.1 pp for the broad sample, and by about 0.8 pp for the restricted sample. The coefficients for fiscal variables are higher in the current account regressions than in the trade balance regressions, which is consistent with the view that more expansionary fiscal policy can increase net income outflows. A comparison of coefficients also suggests the trade channel is more prominent than the rest of the current account.

D. Robustness checks

This section proceeds with some robustness analyses of the empirical framework developed above. Although we conduct several checks, we may not be able to perfectly rule out endogeneity bias.

Nominal exchange rates

The analysis presented so far has investigated the current account / trade balance responses to real effective exchange rate changes. In table 5, the same exercise is conducted considering the main specifications, but now testing whether there is any current account or trade balance response to changes in the nominal effective exchange rate. Although, in principle, the line of economic reasoning suggests there should be a stronger impact from real exchange rates, these can be subject to considerable measurement error, which tends to bias coefficient estimates towards zero. The results suggest an even lower and less robust effect of the nominal effective exchange rate on trade and current account balances than was the case for the real effective exchange rate. Only 2 of 12 specifications show a significant coefficient associated to the nominal exchange rate.

Non-oil current account, non-oil fiscal balance, and exchange rate

Oil price shocks are likely to affect both the fiscal position through revenue and the current account through exports. Therefore, it can be argued that the strong relation identified between fiscal policy and the current account is merely explained by their common sensitivity to the oil price. We have effectively tackled this issue in our empirical tests by including separately government revenue (as a control) and spending (the variable of interest) in the estimated equation, by controlling for country-specific commodity terms of trade, and by checking robustness to inclusion of time dummies.

Rather than controlling for the oil price / oil trade effect, as we have done thus far, we attempt to exclude oil from the analysis. We therefore investigate the effect of the non-oil fiscal balance and the exchange rate on the non-oil current account balance.[25] The size of the country sample used for this exercise is only 16 due to limited availability of oil-related data, so we do not distinguish between the restricted and the broad sample as in the previous sections.

Table 6 shows the real effective exchange rate has a positive and statistically significant effect on the non-oil current account balance in two specifications and an insignificant effect in the third specification (GMM). Depending on the specification, currency depreciations either worsen or do not affect the non-oil current account. A worsening current account would be consistent with our discussion on oil-exporters' characteristics in the context of the Marshall Lerner conditions (Equations 1 and 2). A depreciation will only have a limited effect on import volumes, non-oil exports represent only a small share of total exports, and gains from increased oil receipts are by construction excluded. As a consequence, a weaker currency will likely deteriorate the non-oil current account position. The income flows effects discussed earlier also apply here. A positive non-oil balance coefficient and negative

[25] The non-oil fiscal balance is computed by excluding oil revenue from the overall fiscal balance, and the non-oil current account balance excludes the oil trade balance. It is important to note that non-oil balances do not effectively exclude oil price influences from revenues because, in some cases, non-oil receipts include taxation or dividends from oil companies. This is one reason why it is not our preferred measure.

overall balance coefficient together imply mechanically that (more than) all the beneficial effect of a depreciation works through the oil price measured in local currency.

Regarding the non-oil current account response to changes in the non-oil fiscal balance, the results are in line with our earlier conclusion. A 1 pp. increase in the non-oil fiscal balance improves the non-oil current account by about 0.5-0.85 pp. of GDP. This effect is slightly lower than the current account response to the fiscal balance found in the restricted sample, and higher than the response found in the broad sample.

Bivariate regressions using only the exchange rate

Given the low estimated effects for the exchange rate and the strong effects of fiscal variables, one possibility is that the exchange rate does affect the external accounts but through fiscal variables. If a weaker currency can reduce government spending and raise government (oil) revenue, then it could operate through this indirect channel.[26] We examine this by regressing the external balance on the exchange rate without controlling for fiscal or other variables. These bivariate regressions using GLS yield coefficient estimates of -0.07 for the current account and -0.04 for the trade balance in the broad sample. The coefficient is -0.05 for both the trade and current account balance in the restricted sample. Using other methods (results are available on request), the coefficients are statistically insignificant. Although they are only an informal indicator, these results suggest that the indirect channel is not operating.

Excluding the exchange rate

We show regressions that exclude the exchange rate as an explanatory variable for two reasons. First, to check for the robustness of the fiscal variables excluding the exchange rate given possible confounding factors. Second, the regressions aid the macrobalance approach to assessing current account imbalances. In this approach, a country's current account balance is compared with fitted values from a regression that does not include the exchange rate as an explanatory variable.[27] Given oil exporters' special characteristics, it can be helpful to assess current accounts using regressions for a sample limited to these countries.[28]

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[26] Econometrically, one might find signs of this multicolinearity if the estimated coefficients are less robust across specifications – possibly assigning larger exchange rate and lower government spending effects in some instances. However, our results have been robust.

[27]The role of the exchange rate can be examined in a subsequent stage of the analysis. Fitted values for the current account could be based on optimal values for some variables rather than actual data. For explanations of the methodologies and comparisons with other approaches, see Phillips et al (2013), Beidas-Strom and Cashin (2011), and Bems and Carvalho Filho (2009).

[28] A counter argument in favor of global samples is that current account assessments require multilateral consistency (Phillips et al, 2013).

Table 7 presents current account regressions for the restricted sample. In the first three columns, estimates use the same methodologies and control variables as before but excluding the exchange rate. In column four, we present a fuller set of control variables to be more consistent in specification with the IMF's EBA-Lite methodology (Chen, 2016). This set of controls decreases the sample, so we in column five we exclude variables to restore the number of countries to 15.[29] Column six excludes all insignificant variables. Consistent with earlier regressions, the fiscal coefficients range from 0.7 to 1.2, which is high compared with 0.5 for the global sample (Chen, ibid). When applied to individual countries, this can lead to different assessments of current account balances.[30]

IV. CONCLUSION

In the current low oil price environment, the external positions of oil-exporting countries have deteriorated. Authorities in many of these countries have announced or are contemplating fiscal consolidation plans. Some oil exporters have experienced depreciations, devalued their currencies, or allowed more flexibility, while others have committed to their pegged exchange rates and continued to appreciate alongside the US dollar.

The evidence suggests that recent or potential future changes in the level of the exchange rate will have at most a marginal impact on external balances, which is consistent with limited expenditure switching and/or income effects. Our estimates suggest the elasticity of the trade balance to the real effective exchange rate is up to -0.06 for the broad sample of oil exporters and less for the restricted sample of undiversified oil exporting countries. For the current account balance, the elasticity is perhaps -0.05 for the broad sample and closer to zero for the restricted sample, although many estimates are statistically insignificant or positive. We find that currency depreciation deteriorates the non-oil current account, and assign a marginal effect to nominal exchange rates. The reduced-form estimates are consistent with the theoretical discussions and more structural approaches to estimate trade responses.

The results show that fiscal consolidation is an important part of restoring external balance in oil exporters. For the broad sample, a fall in government spending by 1 percentage point of GDP would increase the trade and current account balances by up to 0.3 percent, in line with some other studies. For the sample restricted to those countries with higher oil dependence, the role of government is bigger; trade balance elasticities are 0.8 while current account elasticities are 1.2. We do not find evidence that exchange rates operate indirectly through

[29] Excluding some control variables also reduces the risk of multicollinearity which may be stronger in our case with a smaller sample (compared to Chen, 2016).

[30] See for example IMF (2017b), which used coefficients from Chen (2016) (EBA-Lite) and from column six of table 7 in this paper (EBA-Oil).

fiscal channels. As motivated in our analytical discussion, these estimates are higher than for broader groups of countries.

Our analysis suggests that, if current account adjustments are required in oil exporting countries, those adjustments are less likely to be successfully effected through the exchange rate. Using an estimated coefficient of -0.05 for the broad sample of oil exporters, even a 50 percent currency depreciation will only increase the current account balance by about 2.5 pp. of GDP, with a much lower impact for the restricted sample. For the latter, the 2.5 pp. improvement in the current account balance could be achieved with an approximately equivalent cut in government spending.

Our approach could be complemented by further work to isolate channels and mechanisms behind the results. Reduced form regressions could have imports, oil/non-oil exports, or remittances as the dependent variable to more precisely see which current account components are affected. Subject to data constraints, the more structural approach to identifying price and volume elasticities (Leigh et al, 2017) for imports and exports could be applied to some oil exporters. Another direction of future research could use a global sample to interact the fiscal or exchange rate coefficients with the characteristics (such as diversification) pertinent to oil exporters to establish if these explain the large fiscal coefficient effects and small exchange rate effects.

Oil is only one of many commodities that have suffered large price declines. Given that some of these have similar characteristics, namely pricing on global markets in US dollars and production at full capacity by price takers, and that many commodity producers are undiviersified, the arguments presented here could apply more broadly than oil.

References

Abbas, S, A Fatas, P Mauro and R Velloso (2011), Fiscal Policy and the Current Account, IMF Economic Review, vol 59(4).

Ahmed, S, M Appendino, and M Ruta (2015), Global Value Chains and the Exchange Rate Elasticity of Exports, IMF Working Paper, WP/15/252.

Araujo, A, B Li, M Poplawski-Ribeiro and L Zanna (2016), Current Account Norms in Natural Resource Rich and Capital Scarce Economies, Journal of Development Economics, vol 120.

Arezki, R and F Hasanov (2013), Global Imbalances and Petrodollars, The World Economy, vol 36(2).

Amiti, M, O Itskhoki and J Konings (2014), Importers, Exporters, and Exchange Rate Disconnect, American Economic Review, vol 104(7).

Auer, R and P Sauré (2012), CHF strength and Swiss export performance – evidence and outlook from a disaggregate analysis, Applied Economics Letters, vol 19.

Baldacci, E, S Gupta and A Mati (2011), Political and Fiscal Risk Determinants of Sovereign Spreads in Emerging Markets, Review of Development Economics, vol 15(2).

Bayoumi, T and H Faruqee (1998), A Calibrated Model of the Underlying Current Account, in (eds) Isard, P and H Faruqee, Exchange Rate Assessment: Extensions of the Macroeconomic Balance Approach, IMF Occasional Paper 167.

Behar, A (2016), Comparing the Employment-Output Elasticities of Migrants and Nationals in the Gulf Co-operation Council, Applied Economics Letters (forthcoming).

Behar, A and J Mok (2013), Does Public-Sector Employment Fully Crowd Out Private-Sector Employment?, IMF Working Paper WP/13/146.

Beidas-Strom, S and P Cashin (2011), Are Middle Eastern Current Account Imbalances Excessive?, IMF Working Paper WP/11/195.

Bems, R and I Carvalho Filho (2009), Exchange Rate Assessments: Methodologies for Oil Exporting Countries, IMF Working paper WP/09/281.

Blundell, R and S Bond (1998), Initial Conditions and Moment Restrictions in Dynamic Panel Data Models, Journal of Econometrics, vol 87.

Bonadio, B, A Fischer and P Sauré (2016), The Speed of the Exchange rate Pass-through, mimeo.

Calderon, C, A Chong and N Loayza (2002), Determinants of Current Account Deficits in Developing Countries, Contributions to Macroeconomics, vol 2(1).

Cerisola, M, C Abdallah, V Davies, and M Fischer (2015), Assessing the Impact of Fiscal Shocks on Output in MENAP Countries, International Monetary Fund Middle East and Central Asia Department Technical Notes and Manuals.

Chen, Ruo (2016), "Methodological Note on EBA-Lite Summary", IMF Policy Paper.

Cherif, R and F Hasanov (2014), Soaring of the Gulf Falcons: Diversification in the GCC Oil Exporters in Seven Propositions, IMF Working Papers.

Dornbusch, R and P Krugman (1976), Flexible Exchange Rates in the Short Run, Brookings Papers on Economic Activity, vol 3.

Espinoza, R and A Senhadji (2011), How Strong are Fiscal Multipliers in the GCC? An Empirical Investigation, IMF Working Paper WP/11/61.

Friedman, M (1953), Essays in Positive Economics, University of Chicago Press.

Gervais, O, L Schembri and L Suchanek (2016), Current account dynamics, real exchange rate adjustment, and the exchange rate regime in emerging-market economies, Journal of Development Economics, vol 119.

Goldberg, L and J Campa (2010), The Sensitivity of the CPI to Exchange Rates: Distribution Margins, Imported Inputs, and Trade Exposure, The Review of Economics and Statistics, vol 92(2).

Gosse, J and F Serranito (2014), Long-run Determinants of Current Accounts in OECD Countries: Lessons for intra-European Imbalances, Economic Modeling, vol 38(C).

Hakura, D and A Billmeier (2008), Trade Elasticities in the Middle East and Central Asia: What is the Role of Oil?, IMF Working Paper WP/08/216.

Hanke, S (2008), Friedman: Float or Fix?, Cato Journal, vol 28(2).

Imbs, J and I Mejean (2015), Elasticity Optimism, American Economic Journal: Macroeconomics, vol 7(3).

IMF (2006), Exchange Rates and Trade Balance Adjustment in Emerging Market Economies, Policy Development and Review Department.

___ (2014), Annual Report on Exchange Rate Restrictions, Washington.

---- (2016), 2016 External Sector Report, Washington.

---- (2017a), The Managing Director's Global Policy Agenda: A More Inclusive and Resilient Global Economy, April 2017, Washington.

---- (2017b), Qatar: Staff Report for the 2016 Article IV Consultation, IMF Country Report 17/88.

Isard (1999), Exchange Rate Economics, Cambridge University Press.

Leigh, D, W Lian, M Poplawski-Ribeiro and V Tsyrennikov (2015), Exchange Rates and Trade Flows: Disconnected?, October 2015 World Economic Outlook, International Monetary Fund.

Leigh, D, W Lian, M Poplawski-Ribeiro, R Szymanski, V Tsyrennikov and H Yang (2017), Exchange Rate and Trade: Disconnect?, International Monetary Fund Working Paper WP/17/58.

Morsy, H (2009), Current Account Determinants for Oil-exporting Countries, IMF Working Paper WP/09/28.

Obstfeld, M and K Rogoff (1996), Foundations of International Macroeconomics, The MIT Press.

Obstfeld, M and K Rogoff (2007), The Unsustainable U.S. Current Account Position Revisited, in R Clarida (ed), G7 Current Account Imbalances: Sustainability and Adjustment, University of Chicago Press.

Ollivaud, P and C Schwellnus (2013), The Post-crisis Narrowing of International Imbalances, OECD Economics Department Working Papers No. 1062.

Orcutt, G (1950), Measurement of Price Elasticities in International Trade, The Review of Economics and Statistics, vol 32(2).

Phillips, S, L. Catão, L Ricci, R. Bems, M Das, J. Di Giovanni, D. Unsal, M Castillo, J. Lee, J. Rodriguez, and M Vargas (2013), The External Balance Assessment (EBA) Methodology, IMF Working Paper WP/13/272.

Roodman, D (2009), A Note on the Theme of Too Many Instruments, Oxford Bulletin of Economics and Statistics, vol 71(1).

Rose, A and J Yellen (1989), Is There a J-Curve?, Journal of Monetary Economics, vol 24.

Sarno, L and M Taylor (2002), The economics of exchange rates, Cambridge University Press.

Versailles, B (2015), MENAP Oil-Exporting Countries: Grappling with Lower Oil Prices and Conflicts, Middle East and Central Asia Department October 2015 Regional Economic Outlook, International Monetary Fund.

Tables

Table 1. Oil Exporters: Keys Characteristics

	Oil exports (% of total exports of goods and services)	Imports (% domestic demand)	Government spending (% domestic demand)	Remittances outflows (% domestic demand)
Emerging Market and Developing	22.6	26.8	27.3	0.6
Broad sample of oil exporters	67.4	41.2	40.9	2.7
More dependent oil exporters	72.7	44.0	43.5	0.3

Table 2. Long-run Price Elasticities of Trade Volumes

Source	Exports	Non-oil exports	Imports
Bayoumi and Faruqee (1998) industrial	-0.71+		0.92+
Bayoumi and Faruqee (1998) developing	-0.53+		0.69+
Leigh and others (2015) global	-0.32^		0.30^
IMF (2006) manufacturing exporters		-0.53	
IMF (2006) oil exporters	-0.16*		
Hakura and Billmeier (2008) oil exporters	-0.13*	-0.67	0.09*

* statistically insignificant; ^ average of country estimates; + model calibrations
Signs on coefficients in response to the price effects following an appreciation.

Table 3. Current Account Balance Regressions

Dependent variable: current account balance (Percent of GDP)

	Including fiscal balance						Including spending and revenue separately					
	Full sample			Restricted sample			Full sample			Restricted sample		
	FE	GLS	GMM	FE	GLS	GMM	FE	GLS	GMM	FE	GLS	GMM
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Fiscal balance	0.170	0.296***	0.209*	1.221***	0.981***	1.223***						
	(0.177)	(0.044)	(0.121)	(0.171)	(0.053)	(0.078)						
Gov. spending							-0.099	-0.241***	-0.205*	-1.414***	-1.065***	-1.304***
							(0.149)	(0.045)	(0.111)	(0.242)	(0.066)	(0.229)
Gov. revenue							1.000***	0.444***	0.461*	0.835***	0.898***	0.738***
							(0.283)	(0.062)	(0.241)	(0.130)	(0.070)	(0.246)
L.Net foreign assets	-0.000	0.030***	0.020	0.037**	0.030***	0.049**	-0.021	0.022**	0.017	0.042**	0.022**	0.010
	(0.044)	(0.009)	(0.019)	(0.018)	(0.009)	(0.020)	(0.048)	(0.009)	(0.022)	(0.019)	(0.010)	(0.041)
Commodity ToT*Trade_open	0.511***	0.803***	0.205***	0.274	0.438***	0.483***	0.416***	0.720***	0.598***	0.295	0.416***	1.026***
	(0.141)	(0.068)	(0.069)	(0.193)	(0.082)	(0.180)	(0.141)	(0.069)	(0.054)	(0.190)	(0.092)	(0.391)
GDP growth, forecast 5 years	-1.061**	-0.146	-1.595***	-0.927***	-0.496**	-1.132**	-0.658*	-0.228	1.670**	-1.313***	-0.664***	-1.325
	(0.443)	(0.190)	(0.421)	(0.278)	(0.215)	(0.466)	(0.375)	(0.197)	(0.838)	(0.297)	(0.236)	(1.740)
Dependency ratio	0.196	0.220**	2.303***	0.474	0.226	1.472***	0.234	0.161	-0.003	0.643	0.239	1.456*
	(0.623)	(0.099)	(0.440)	(0.524)	(0.144)	(0.478)	(0.619)	(0.113)	(0.245)	(0.567)	(0.162)	(0.811)
L.Output per worker*K.open	-0.075	0.018	0.125*	-0.106*	-0.026	0.102	-0.061	0.001	0.018	-0.136**	-0.027	0.134**
	(0.053)	(0.025)	(0.076)	(0.059)	(0.024)	(0.064)	(0.055)	(0.028)	(0.031)	(0.058)	(0.025)	(0.057)
Demeaned private credit/GDP	-0.268***	-0.201***	-0.207**	-0.093*	-0.143***	-0.179	-0.178***	-0.184***	-0.049	-0.112**	-0.162***	-0.196
	(0.079)	(0.033)	(0.081)	(0.047)	(0.033)	(0.114)	(0.068)	(0.033)	(0.069)	(0.049)	(0.037)	(0.162)
Aid/GDP	0.945	-0.336	0.961	-0.796**	-0.627**	-0.016	0.276	-0.470*	-1.378	-0.793*	-0.532*	1.711
	(1.199)	(0.252)	(0.865)	(0.355)	(0.281)	(1.476)	(0.990)	(0.250)	(1.362)	(0.443)	(0.306)	(2.406)
Oil resource temporariness	0.038***	-0.001	0.048**	0.336	-1.579	0.024	0.031***	0.004	-0.001	0.028***	0.012	0.044
	(0.011)	(0.007)	(0.023)	(2.046)	(1.339)	(0.032)	(0.010)	(0.007)	(0.026)	(0.009)	(0.007)	(0.045)
Ln(REER)	-2.528	-4.064***	4.321	0.026***	0.011	-3.840	3.556	-5.513***	-4.923	-5.391**	-2.693*	-0.704
	(2.650)	(1.442)	(10.605)	(0.009)	(0.007)	(6.852)	(3.210)	(1.485)	(9.615)	(2.517)	(1.595)	(12.671)
L.current account balance			0.414***			0.134			0.121*			0.211
			(0.053)			(0.124)			(0.062)			(0.251)
Constant	16.773	22.274***	22.274***	6.815	12.174*	39.083	-14.636	28.338***	23.640	37.561**	17.313**	23.127
	(17.968)	(6.559)	(6.559)	(13.182)	(6.587)	(32.990)	(22.698)	(6.787)	(46.399)	(16.064)	(7.837)	(63.544)
Observations	491	491	146	318	318	94	486	486	143	324	324	95
Adjusted R-squared	0.293	.	.	0.797			0.341	.	.	0.773	.	.
Wald chi2 stat.	.	0	0	.	0	0	.	0	0	.	0	0
Hansen J test	.	.	0.224	.	.	0.229	.	.	0.584	.	.	0.386
Test for AR(2)	.	.	0.370	.	.	0.838	.	.	0.488	.	.	0.410
Diff.-in-Hansen	.	.	0.14	.	.	0.878	.	.	0.584	.	.	0.229
Number of country	24	24	24	15	15	15	23	23	23	15	15	15

Robust standard errors in parentheses. ***, **, and * indicate statistical significance at the 1, 5, and 10percent levels, respectively. Country fixed effect included but not reported. GLS estimates with panel-wide AR(1) correction. The list of instruments for GMM-system is limited to the maximum of two first lags, to avoid the risk of "too many instruments". P values of chi2, Hansen tests, and AR(2) test are reported. The Wald chi2 test is a test of the null hypothesis that all the coefficients, except the constant, are jointly equal to zero. The Hansen test of overidentifying restrictions tests the null hypothesis that the instruments are valid. The difference in Hansen tests the validity of a subset of instruments. The AR (2) tests the hypothesis of no second-order serial correlation.

Table 4: Trade Balance Regressions

Dependent Variable: Trade Balance (Percent of GDP)

	Including fiscal balance						Including spending and revenue separately					
	Full sample			Restricted sample			Full sample			Restricted sample		
	FE	GLS	GMM	FE	GLS	GMM	FE	GLS	GMM	FE	GLS	GMM
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Fiscal balance	0.158	0.220***	0.228***	0.813***	0.709***	0.707***						
	(0.103)	(0.035)	(0.037)	(0.027)	(0.034)	(0.151)						
Gov. spending							-0.108	-0.126***	-0.188**	-0.837***	-0.733***	-0.966***
							(0.091)	(0.036)	(0.074)	(0.068)	(0.048)	(0.338)
Gov. revenue							0.806***	0.527***	0.883***	0.828***	0.686***	0.300**
							(0.140)	(0.055)	(0.161)	(0.085)	(0.066)	(0.121)
L.Net foreign assets	-0.001	-0.004	0.002	0.023**	-0.006	0.003	-0.015	-0.010	-0.023**	0.015	-0.022**	0.065
	(0.019)	(0.007)	(0.007)	(0.010)	(0.009)	(0.025)	(0.019)	(0.007)	(0.009)	(0.011)	(0.010)	(0.104)
Oil resource temporariness	0.025**	0.008	0.035***	0.015*	0.016*	0.021	0.021**	0.013	0.022	0.017*	0.015	0.044
	(0.010)	(0.009)	(0.008)	(0.009)	(0.009)	(0.102)	(0.009)	(0.009)	(0.017)	(0.009)	(0.010)	(0.066)
Commodity ToT*Trade_open	0.625***	0.744***	0.251***	0.757***	0.568***	0.983	0.550***	0.592***	0.138	0.651***	0.538***	1.628
	(0.100)	(0.063)	(0.039)	(0.106)	(0.071)	(0.714)	(0.096)	(0.063)	(0.137)	(0.123)	(0.080)	(2.470)
L.Relative Output per worker	-0.007	0.105***	0.062***	-0.152***	0.090***	0.077**	-0.027	0.080***	0.046***	-0.154***	0.090***	0.112
	(0.081)	(0.025)	(0.011)	(0.028)	(0.023)	(0.034)	(0.069)	(0.024)	(0.017)	(0.030)	(0.025)	(0.079)
Demeaned private credit/GDP	-0.244***	-0.253***	-0.160***	-0.101***	-0.213***	-0.046	-0.160***	-0.243***	-0.157***	-0.100**	-0.240***	-0.553
	(0.042)	(0.037)	(0.040)	(0.038)	(0.038)	(0.119)	(0.035)	(0.036)	(0.056)	(0.041)	(0.042)	(1.107)
Aid/GDP	0.013	-0.397*	0.330	-0.632*	-0.415*	0.784	-0.478	-0.517**	0.053	-0.561	-0.483*	2.343
	(0.664)	(0.227)	(0.251)	(0.351)	(0.237)	(1.924)	(0.602)	(0.213)	(0.475)	(0.356)	(0.251)	(6.957)
GDP growth, forecast 5 years	-1.055***	-0.222	-1.371***	-1.134***	-0.479**	-1.767***	-0.824***	-0.344*	-1.768**	-1.263***	-0.560**	-2.925
	(0.312)	(0.198)	(0.446)	(0.278)	(0.229)	(0.649)	(0.276)	(0.195)	(0.710)	(0.289)	(0.243)	(4.859)
Ln(REER)	-5.754***	-5.595***	-7.860**	-3.677**	-0.578	-31.567	-1.883	-5.516***	-5.235	-5.068**	-1.263	-16.372
	(1.885)	(1.548)	(3.204)	(1.611)	(1.663)	(21.242)	(2.007)	(1.580)	(4.043)	(2.035)	(1.842)	(11.373)
L.trade balance			0.244***			0.159**			0.220**			-0.173
			(0.044)			(0.067)			(0.108)			(0.810)
Constant	31.561***	30.112***	39.515***	19.503**	8.798	149.760	10.612	29.652***	27.044	25.438**	12.201	75.797
	(9.584)	(7.032)	(14.344)	(8.001)	(7.735)	(100.189)	(9.988)	(7.167)	(18.689)	(10.260)	(8.601)	(60.361)
Observations	509	509	150	320	320	94	504	504	147	326	326	95
Adjusted R-squared	0.532	.	.	0.811	.	.	0.576	.	.	0.778	.	.
Wald chi2 stat.	.	0	0	.	0	0	.	0	0	.	0	0
Hansen J test	.	.	0.441	.	.	0.744	.	.	0.164	.	.	0.305
Test for AR(2)			0.359			0.785			0.533			0.833
Diff.-in-Hansen			0.644			0.702			0.697			0.225
Number of country	24	24	24	15	15	15	24	24	24	15	15	15

Robust standard errors in parentheses. ***, **, and * indicate statistical significance at the 1, 5, and 10percent levels, respectively. Country fixed effect included but not reported. GLS estimates with panel-wide AR(1) correction. The list of instruments for GMM-system is limited to the maximum of two first lags, to avoid the risk of "too many instruments". P values of chi2, Hansen tests, and AR(2) test are reported. The Wald chi2 test is a test of the null hypothesis that all the coefficients, except the constant, are jointly equal to zero. The Hansen test of overidentifying restrictions tests the null hypothesis that the instruments are valid. The difference in Hansen tests the validity of a subset of instruments. The AR (2) tests the hypothesis of no second-order serial correlation.

Table 5: Current account and trade balance responses to nominal effective exchange rate

	Dependent variable: current account balance (% of GDP)						Dependent variable: trade balance (% of GDP)					
	Full sample			Restricted sample			Full sample			Restricted sample		
	FE	GLS	GMM	FE	GLS	GMM	FE	GLS	GMM	FE	GLS	GMM
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Fiscal balance (%GDP)	0.167	0.307***	0.316***	1.176***	0.955***	0.670**	0.157	0.240***	0.629***	0.792***	0.728***	0.611***
	(0.186)	(0.044)	(0.114)	(0.168)	(0.054)	(0.306)	(0.108)	(0.034)	(0.081)	(0.021)	(0.028)	(0.171)
L.Net foreign assets	-0.028**	-0.016**	-0.025***	-0.014**	-0.014**	0.008	-0.009	-0.011*	0.003	-0.001	-0.004	-0.011
	(0.011)	(0.007)	(0.005)	(0.006)	(0.006)	(0.040)	(0.007)	(0.006)	(0.007)	(0.005)	(0.005)	(0.010)
Oil resource temporariness	0.034***	0.007	0.018**	0.020**	0.007	-0.014	0.022**	0.007	0.038*	0.012	0.001	-0.061
	(0.012)	(0.008)	(0.008)	(0.008)	(0.008)	(0.022)	(0.010)	(0.008)	(0.021)	(0.008)	(0.009)	(0.126)
Commodity ToT*Trade_open	0.534***	0.777***	0.635***	0.371**	0.493***	-0.688	0.626***	0.767***	0.288***	0.802***	0.615***	0.492
	(0.134)	(0.070)	(0.038)	(0.183)	(0.081)	(0.483)	(0.101)	(0.060)	(0.108)	(0.103)	(0.066)	(0.452)
GDP growth, forecast 5 years	-0.877*	-0.019	-1.163**	-0.720***	-0.471**	0.331	0.027	-0.105***	-1.344***	-0.104***	-0.102***	-1.467**
	(0.462)	(0.208)	(0.529)	(0.274)	(0.230)	(1.202)	(0.078)	(0.033)	(0.448)	(0.029)	(0.033)	(0.684)
Dependency ratio	-0.365	0.454	0.849*	-0.236	0.208	0.271						
	(0.699)	(0.390)	(0.496)	(0.462)	(0.392)	(0.528)						
L.Relative Output per worker	0.003	-0.073**	0.144***	-0.032	-0.085*	0.064	0.027	-0.105***	0.184***	-0.104***	-0.102***	0.103**
	(0.057)	(0.037)	(0.026)	(0.055)	(0.044)	(0.040)	(0.078)	(0.033)	(0.021)	(0.029)	(0.033)	(0.041)
Demeaned private credit/GDP	-0.297***	-0.221***	-0.152**	-0.201***	-0.222***	0.158	-0.252***	-0.190***	-0.249*	-0.204***	-0.198***	-0.417***
	(0.053)	(0.035)	(0.064)	(0.065)	(0.037)	(0.174)	(0.045)	(0.032)	(0.142)	(0.042)	(0.033)	(0.107)
Aid/GDP	0.875	-0.361	0.756	-0.924**	-0.387	1.377	0.030	-0.410*	2.862***	-0.672**	-0.527**	-0.357
	(1.337)	(0.276)	(0.748)	(0.373)	(0.336)	(2.182)	(0.717)	(0.218)	(0.864)	(0.317)	(0.242)	(1.114)
Ln(NEER)	-1.363	-1.148	-3.297**	0.081	0.421	-7.812	-0.853	-1.114*	0.778	0.441	0.125	3.581
	(1.650)	(0.789)	(1.311)	(1.289)	(0.928)	(10.083)	(1.089)	(0.656)	(2.138)	(0.767)	(0.754)	(4.424)
L.current account balance			0.184**			0.428**						
			(0.089)			(0.204)						
L.trade balance									0.204***			0.244***
									(0.078)			(0.068)
Constant	2.959	14.249*	26.888***	-3.444	1.791	44.767	8.707	7.678*	-5.484	-0.685	0.945	-10.599
	(15.020)	(7.847)	(9.432)	(8.766)	(7.570)	(46.704)	(5.692)	(4.197)	(11.222)	(4.268)	(4.184)	(23.296)
Observations	504	504	149	331	331	97	511	511	148	337	337	96
Adjusted R-squared	0.300	.	.	0.762	.	.	0.531	.	.	0.798	.	.
Wald chi2 stat.	.	0	0	.	0	0	.	0	0	.	0	0
Hansen J test	.	.	0.865	.	.	0.537	.	.	0.533	.	.	0.835
Test for AR(2)	.	.	0.360	.	.	0.396	.	.	0.394	.	.	0.643
Diff.-in-Hansen	.	.	0.356	.	.	0.190	.	.	0.127	.	.	0.714
Number of country	24	24	24	15	15	15	24	24	24	15	15	15

Robust standard errors in parentheses. ***, **, and * indicate statistical significance at the 1, 5, and 10percent levels, respectively. Country fixed effect included but not reported. GLS estimates with panel-wide AR(1) correction. The list of instruments for GMM-system is limited to the maximum of two first lags, to avoid the risk of "too many instruments". P values of chi2, Hansen tests, and AR(2) test are reported. The Wald chi2 test is a test of the null hypothesis that all the coefficients, except the constant, are jointly equal to zero. The Hansen test of overidentifying restrictions tests the null hypothesis that the instruments are valid. The difference in Hansen tests the validity of a subset of instruments. The AR (2) tests the hypothesis of no second-order serial correlation.

Table 6. Non-Oil Current Account Response to Non-oil Fiscal Balance and Exchange Rate

	Dependent variable: Non-oil current account balance (Percent of GDP)		
	FE	GLS	GMM
	(1)	(2)	(3)
Non-oil fiscal balance	0.815***	0.511***	0.860***
	(0.312)	(0.080)	(0.270)
L.Net foreign assets	-0.032	-0.028*	0.113
	(0.027)	(0.016)	(0.148)
Commodity ToT*Trade_open	-0.505	-0.161	2.191**
	(0.359)	(0.129)	(1.078)
GDP growth, forecast 5 years	-0.301	-0.201	-3.011
	(0.476)	(0.307)	(3.223)
Dependency ratio	-1.087	-1.433**	0.242
	(1.107)	(0.658)	(1.197)
L.Output per worker*K.open	-0.047	-0.056	0.020
	(0.075)	(0.067)	(0.123)
Demeaned private credit/GDP	-0.415***	-0.154**	-0.044
	(0.122)	(0.066)	(0.457)
Aid/GDP	-1.786***	-1.151**	-0.069
	(0.595)	(0.517)	(7.512)
Oil resource temporariness	0.016*	0.007	0.039*
	(0.010)	(0.009)	(0.022)
Ln(REER)	21.640***	9.403***	-10.565
	(4.429)	(3.472)	(29.850)
L.non-oil current account balance			0.421
			(0.368)
Constant	-133.651***	-86.517***	54.890
	(24.625)	(19.298)	(160.965)
Observations	294	294	83
Adjusted R-squared	0.866	.	.
Wald chi2 stat	.	0	0
Hansen J test	.	.	0.113
Test for AR(2)			0.180
Diff.-in-Hansen			0.25
Number of country	16	16	16

Robust standard errors in parentheses. ***, **, and * indicate statistical significance at the 1, 5, and 10percent levels, respectively. Country fixed effect included but not reported. GLS estimates with panel-wide AR(1) correction. The list of instruments for GMM-system is limited to the maximum of two first lags, to avoid the risk of "too many instruments". P values of chi2, Hansen tests, and AR(2) test are reported. The Wald chi2 test is a test of the null hypothesis that all the coefficients, except the constant, are jointly equal to zero. The Hansen test of overidentifying restrictions tests the null hypothesis that the instruments are valid. The difference in Hansen tests the validity of a subset of instruments. The AR (2) tests the hypothesis of no second-order serial correlation.

Table 7: Current account regressions – excluding the exchange rate

	Dependent variable: current account balance (percent of GDP)					
	FE	GLS	GMM	GLS	GLS	GLS
	(1)	(2)	(3)	(4)	(5)	(6)
Fiscal balance	1.176***	0.909***	1.008***	0.742***	0.919***	0.802***
	(0.165)	(0.055)	(0.106)	(0.075)	(0.053)	(0.055)
L.Net foreign assets	-0.014**	-0.000	-0.017	0.026**	0.004	
	(0.005)	(0.006)	(0.011)	(0.013)	(0.006)	
Commodity ToT*Trade_open	0.371**	0.494***	0.749***	0.317***	0.342***	0.474***
	(0.186)	(0.081)	(0.203)	(0.097)	(0.080)	(0.086)
GDP growth, forecast 5 years	-0.718***	-0.437*	-0.285	-0.642***	-0.315	
	(0.269)	(0.225)	(0.527)	(0.244)	(0.227)	
Dependency ratio	-0.243	0.044	0.952	0.361	0.028	
	(0.452)	(0.146)	(0.758)	(0.233)	(0.161)	
L.Output per worker*K.open	-0.032	-0.017	0.111	0.093	-0.032	
	(0.054)	(0.026)	(0.080)	(0.076)	(0.027)	
Demeaned private credit/GDP	-0.199***	-0.191***	-0.325***	-0.031	-0.070	
	(0.042)	(0.033)	(0.124)	(0.049)	(0.047)	
Aid/GDP	-0.926**	-0.772***	-1.383	-0.943*	-0.747***	-0.771***
	(0.369)	(0.292)	(1.187)	(0.530)	(0.273)	(0.284)
Oil resource temporariness	0.020***	0.007	0.006			
	(0.008)	(0.007)	(0.023)			
L.current account balance			0.103			
			(0.131)			
L.Output per worker (relative to top 3 eco.)				-0.016		
				(0.062)		
Oil, gas trade Balance*resource temp.				0.046		
				(0.073)		
Population growth				-0.203		
				(0.283)		
Dependency R.* Aging Speed				-0.009		
				(0.012)		
Aging speed* rel. Dependency ratio				-0.039***		
				(0.013)		
∆Reserves/GDP*K. controls				0.570***		
				(0.105)		
Remittances/GDP				0.671***		
				(0.189)		
Output gap				-0.010		
				(0.085)		
Institutions/political environment				-0.025		
				(0.062)		
Constant	-3.124	2.391	14.373	-2.014	4.274*	3.796***
	(6.823)	(2.271)	(10.392)	(4.188)	(2.452)	(0.618)
Observations	331	331	97	162	332	351
Adjusted R-squared	0.763	.	.	.	.	.
Wald chi2 stat.	.	0	0	0	0	0
Hansen J test		.	0.202			
Test for AR(2)	.	.	0.817	.	.	.
Diff.-in-Hansen	.	.	0.540	.	.	.
Number of id	15	15	15	10	15	15

Robust standard errors in parentheses. ***, **, and * indicate statistical significance at the 1, 5, and 10percent levels, respectively. Country fixed effect included but not reported. GLS estimates with panel-wide AR(1) correction. The list of instruments for GMM-system is limited to the maximum of two first lags, to avoid the risk of "too many instruments". P values of chi2, Hansen tests, and AR(2) test are reported. The Wald chi2 test is a test of the null hypothesis that all the coefficients, except the constant, are jointly equal to zero. The Hansen test of overidentifying restrictions tests the null hypothesis that the instruments are valid. The difference in Hansen tests the validity of a subset of instruments. The AR (2) tests the hypothesis of no second-order serial correlation.

Appendix

Appendix Table 1. Sample

Full sample	Restricted sample
Algeria	Algeria
Angola	Azerbaijan
Azerbaijan	**Bahrain**
Bahrain	Colombia
Chad	Congo Republic of
Colombia	Gabon
Congo Republic of	Iran
Ecuador	**Kuwait**
Equatorial Guinea	Libya
Gabon	Nigeria
Iran	**Oman**
Kazakhstan	**Qatar**
Kuwait	**Saudi Arabia**
Libya	**United Arab Emirates**
Nigeria	Yemen
Oman	
Qatar	
Russian Federation	
Saudi Arabia	
Sudan	
Trinidad and Tobago	
United Arab Emirates	
Venezuela	
Yemen	

GCC countries in bold

Appendix Table 2. Variables Description and Source

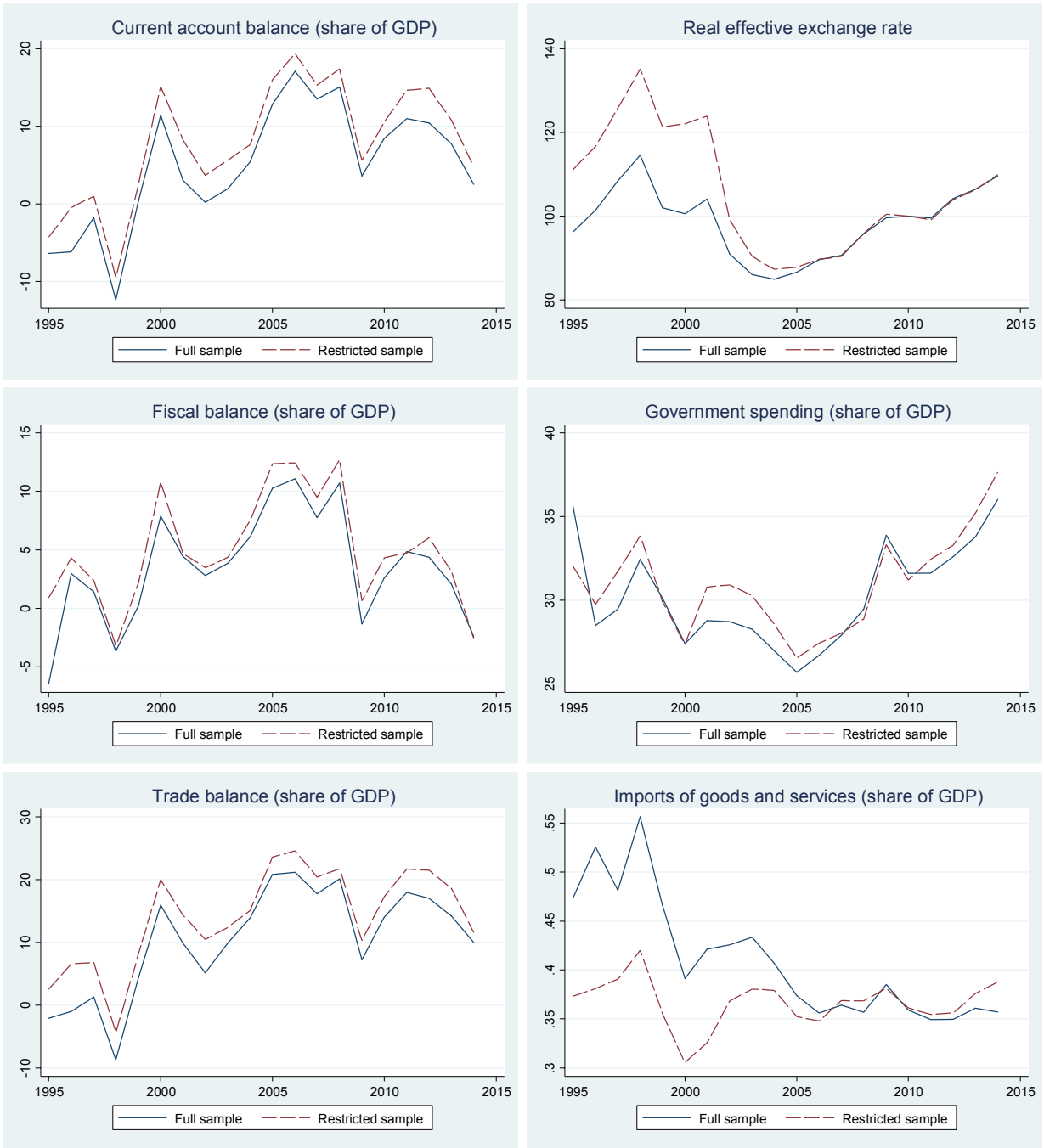
Variable	*Description*	*Source*
Net foreign assets	Net foreign assets in percentage of GDP	Update of Lane and Milesi-Ferretti (2007)
Commodity terms of trade	Ratio of a geometric weighted average price of 43 commodity exports categories to a geometric weighted average price of 43 commodity imports categories, each relative to advanced economies manufactured goods prices	EBA-lite template; IMF External Balance Assessment tool - see Phillips et al., 2013; Chen, 2016.
GDP growth (5 years forecast)	GDP growth forecast in 5 years	World Economic outlook (WEO)
Dependency ratio	Population (65+)/Population (30-64)	UN population
Demeaned private credit to GDP	Deviation of credit to the private non-financial sector from historical average, for each country	World Development Indicators
Relative output per worker	Ratio of PPP GDP to working age population (15-64)	UN population, WEO
Oil resource temporariness	Ratio of current extraction of oil to proven reserve from the BP Statistical Review, divided by the same ratio for Norway in 2010. Higher value indicates that the resource is expected to be exhausted sooner.	BP Statistical Review of World Energy
Oil trade balance	Oil trade balance in percentage of GDP	WEO
Aid/GDP	Aid in percentage of GDP	Organization of Economic Cooperation and Development
Current account balance	Current account balance expressed in percentage of GDP	WEO
Trade balance	Exports of goods and services - imports of goods and service	
Trade openness	(exports of goods + imports of goods)/(2*GDP)	WEO
Capital controls	Capital control index (between 0 and 1) based on Chinn-Ito index	http://web.pdx.edu/~ito/Chinn-Ito_website.htm
Aging speed	Projection of change in old age dependency ratio, relative to world average	UN population
Cyclically adjusted fiscal balance	Cyclically adjusted fiscal balance, relative to world average	EBA-lite template
Fiscal balance	General government primary fiscal balance in percentage of GDP, relative to world average	WEO
Government spending	General government total spending in percentage of GDP, relative to world average	WEO
Government revenue	General government total revenue in percentage of GDP, relative to world average	WEO
REER	Real effective exchange rate, index = 100 in 2010	Information notice system
NEER	Nominal effective exchange rate	Information notice system
∆Reserves/GDP	Change in foreign exchange reserves in percentage of GDP	WEO
Output per worker, relative to the top 3 economies	Ratio of PPP GDP to working age population (15-64), relative to the same ratio for Germany, Japan, and USA	EBA-lite template
GCC dummy	Dummy variable taking the value of 1 if the country is a GCC member, and 0 otherwise	Authors
Remittances/GDP	Remittances in percentage of GDP, relative to world average	Remittances from IMF BOPS divided by GDP in current US dollars from WEO, supplemented with remittances as a share of GDP from WDI
Population growth	Population growth rate	UN population
Output gap	Output gap, relative to world average	WEO, or HP filter
Safer institutions/political environment	International Country Risk Guide index, relative to world average	ICRG

Appendix Table 3. Correlation Table

	Current account balance/GDP	Fiscal balance	NFA/GDP	Oil resource temporariness	Commodity ToT*trade open	GDP growth, forecast 5Y	Dependency ratio	Output per worker*K.open	Private credit/GDP	Aid/GDP	REER	NEER	Trade balance/GDP	Gov. spending	Gov. revenue
Current account balance/GDP	1														
Fiscal balance	0.2507*	1													
NFA/GDP	0.3992*	0.1169*	1												
Oil resource temporariness	-0.0498	0.0404	-0.0984*	1											
Commodity ToT*trade open	0.2257*	-0.1623*	0.0521	-0.0072	1										
GDP growth, forecast 5Y	0.0311	0.2216*	0.042	0.0317	0.0243	1									
Dependency ratio	-0.1577*	-0.0921*	-0.4841*	-0.0103	-0.003	-0.044	1								
Output per worker*K.open	0.2150*	0.0834	0.7185*	-0.0804*	0.0187	0.0228	-0.6454*	1							
Private credit/GDP	-0.2161*	-0.2509*	-0.0181	0.007	-0.0131	-0.0770*	0.0983*	0.0920*	1						
Aid/GDP	-0.3158*	-0.6506*	-0.2968*	0.0061	0.0305	-0.2737*	0.1229*	-0.1795*	0.2484*	1					
REER	-0.0627	0.0458	0.0579	-0.0251	0.0288	0.0157	-0.0248	-0.0036	0.3187*	-0.0119	1				
NEER	-0.0303	0.0187	-0.0837*	0.0159	0.0161	0.0018	-0.0087	-0.019	0.0236	0.0443	-0.0516	1			
Trade balance/GDP	0.7000*	0.3783*	0.2201*	0.0206	0.2569*	0.1179*	-0.1930*	0.2702*	-0.3344*	-0.3672*	-0.0404	-0.0234	1		
Gov. spending	-0.1263*	-0.9572*	-0.0119	-0.0933*	0.1848*	-0.2059*	0.023	0.0091	0.1970*	0.6184*	-0.0444	0.009	-0.2251*	1	
Gov. revenue	0.3751*	0.0869*	0.4160*	-0.2022*	0.0904*	0.0497	-0.3023*	0.3849*	-0.1895*	-0.1195*	0.0287	0.0485	0.4448*	0.1959*	1

Note: * indicates statistical significance at a 5percent level or lower.

Figure 1. External balance, fiscal policy and exchange rate, 1995-2014



Source: World Economic Outlook, Information Notice System