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

by Alberto Behar and Armand Fouejieu

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

Prepared by Alberto Behar and Armand Fouejieu[1]

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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 (including the Gulf Cooperation Council), a strong relationship with the fiscal balance or government spending.

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AUTHOR'S E-MAIL ADDRESS: ABEHAR@IMF.ORG, AFOUEJIEU@IMF.ORG

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I. INTRODUCTION

For the past decade, oil exporters enjoyed large current account surpluses, raising questions at the time about whether these are too big from a normative point of view and from the perspective of global imbalances (Beidas Strom and Cashin, 2011; Arezki and Hasanov, 2013). 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. Futures prices imply oil will not recover materially over the medium term.

Although likely to be on net beneficial for the global economy (Husain, Arezki, Breuer, Haksar, Helbling, Medas, and Sommer, 2015), this will come largely at the expense of oil exporters, where some of the impacts have been immediate. In addition to considerable fiscal strains, 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.[2] Therefore, policy makers in oil exporting countries are considering ways to increase their current account balances.

A natural tool for external adjustment is the exchange rate. Some oil exporters have seen their currencies weaken alongside oil, while those remaining pegged to the US dollar have experienced effective appreciations.[3] 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.[4] Similarly, a weaker currency has the potential to make foreign products more expensive and reduce imports through both income and expenditure switching effects. Some have argued that exchange rate changes could make a big contribution to current account balances for individual countries and reduce imbalances from a global perspective (Cardarelli and Rebucci, 2007).

However, oil exporters have a number of special characteristics that may blunt the effectiveness of the exchange rate as a tool for adjusting the trade balance and hence the

[2] 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).

[3] 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. There appears to be no empirical consensus on whether greater flexibility facilitates current account adjustment. See for example Chinn and Wei (2013); Broda (2004); Ghosh, Qureshi and Tsangarides (2013); Fischer (2001); and Gervais and others (2016).

[4] From a structural perspective, some see competitively valued exchange rates as crucial to promote exports and growth (Freund and Pierola, 2012, Eichengreen and Gupta, 2013, and Nicita, 2013).

current account balance.[5] Following a depreciation, there may be some income compression, but their undiversified economies limit the scope for import substitution, yet dearer imports would weaken the trade balance. Similarly, with possibly a handful of exceptions, oil producers are price-takers producing at full capacity, so total export volume gains could be negligible. However, depreciation would raise local-currency prices for exports to a greater extent than for other 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, and many of them have announced fiscal consolidation plans. 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 and migrant dependent than in other countries, which suggests that government expenditure decisions could have a larger bearing on the current account than in other economies.

Fiscal and exchange rate policy are of course not mutually exclusive. Both instruments could be used simulatenously. 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.

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. We regress the current account balance on the exchange rate and on fiscal policy variables. One important advantage of the reduced-form approach 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.

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 stronger than exchange rate changes. 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 account.

[5] This paper does not discuss the effects of exchange rates on the financial account of the balance of payments or on private or sovereign balance sheets.

Our analysis builds on existing empirical work on oil exporters (Beidas-Strom and Cashin, 2011; Arezki and Hasanov 2013, Morsy, 2009) and broader groups of countries.[6] However, 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. Moreover, we distinguish between a relatively broad group of oil exporters and a narrower subset of more oil-dependent economies and the Gulf Co-operation Council (GCC) countries.

Regressions of the trade balance are comparatively scarce in the literature (Ollivaud and Schwellnus, 2013) so our paper fills a sizeable gap between reduced-form current account balance regressions and a related literature on structural trade equation estimates. Leigh, Lian, Poplawski-Ribeiro, and Tsyrennikov (2015)[7] 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 volumes responses to exchange rate changes are negligible.

Our paper proceeds as follows. Section II elabroates 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 broad samples of advanced and emerging countries, we describe the special characteristics of oil exporters that undermine the role of the exchange rate and amplify the role of fiscal policy. This section includes an adaptation of the equations governing the Marshall Lerner conditions to oil exporters in order to compare competing trade volume and trade price effects. In addition, a toy Keyenesian Cross model illustrates the response of the trade balance to government spending.

Section III discusses the empirical results. We base our econometric work on a range of estimation techniques deployed to 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 that includes the GCC and the 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 insignificant or positive. This is lower than found in the literature for other countries. For the restricted sample, the response could be even smaller and estimates are less robust. The regressions also suggest that depreciations have a slightly more beneficial impact on the trade balance

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

[7] Also see Leigh, Lian, Poplawski-Ribeiro, Szymanski, Tsyrennikov and Yang (2016).

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 0.8. For the broader sample, the elasticity of the trade or current account balance with respect to government spending is up to 0.3, which is closer to that found for other country groups. Estimates for the fiscal balance are similar to but not quite as high as for government spending. We do not find evidence that exchange rates affect the external accounts indirectly via the fiscal balance or government spending.

Section IV concludes and suggests potential future research.

II. THEORETICAL CHANNELS AND EXISTING RELEVANT LITERATURE

Exchange rate changes lead to changes in relative prices between domestic and foreign goods, which affect incentives to import and export. However, this section will demonstrate important differences across products on how prices are set, which make the transmission from exchange rates to oil exports different to manufacturing. We will argue that undiversified oil exporters should have low import volume elasticities for a given price change. For computing the effect on the trade balance, import and export volume effects need to be compared with price effects, so it is far from pre-ordained that depreciations improve the trade balance. The exchange rate also affects other items in the current account, including primary (investment) and secondary (remittances) income flows.

The fiscal balance has links with the external balance, and we will argue that the connection is likely to be especially strong in at least some oil exporters. Government spending could affect the current account through imports, exports, as well as investment and remittance income flows.

Although this section attempts to discuss the channels from fiscal policy or the exchange rate to the current account in a comprehensive manner, it does not seek to do so in an overarching formal model.

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. It 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.

- 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). 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).
- A large empirical literature indicates incomplete pass-through of exchange rate changes to international prices. Empirical studies typically find that there is a sizable degree of pricing to market; exporters adjust prices only partially in response to exchange rate movements (Goldberg and Campa, 2010). Consistent with this, estimates in Leigh and others (2015) have an average long-term pass-through from exchange rates to import (local currency) or export (foreign currency) prices of close to 0.6.
- 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).
- To the extent that the value of the exporter's currency will make the exporter's goods cheaper for foreigners, this will stimulate foreigners' demand for the exporter's products.[8] 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). The price of oil is set in US dollars internationally and most producers face a perfectly elastic demand curve. Especially in the less diversified oil exporters, non-oil exports make a small contribution to the export basket. Moreover, high

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

import dependence and limited substitution possibilities reduce the responsiveness of import volumes to relative prices. We discuss these mechanics in more detail in the rest of this subsection.

Table 1. Oil Exporters: Keys Characteristics

	Oil exports (% of total exports of goods and services)	Imports (% of domestic demand)	Government spending (% of domestic demand)	Remittances outflows (% of domestic demand)
Emerging Market and Developing Economies	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
Of which				
GCC	65.8	58.8	52.9	7.3

There is generally no scope for the real exchange rate to affect oil export volumes. To varying degrees, there is no tradable sector other than oil and gas, and, to a lesser extent, products that are derived from hydrocarbons or rely on subsidized energy (for example, aluminum). Importantly, prices for oil and gas are set in international markets. 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 consumption faces distorted price signals (domestic prices are below international pre-tax levels in many countries despite cheaper oil and recent reforms), and these exports require limited inputs.

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.

Scope for addressing current account imbalances through the non-oil export side is limited. Because non-oil goods and services contribute a small share to the export basket, it would take an unrealistically large change in their value to have a meaningful impact on the current account balance. This factor is especially true 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.

For undiversified economies with large import components, exchange rate pass through generally reduces the extent to which a fall in the value of the currency would translate to real exchange rate changes. Especially in the GCC, labor market characteristics reduce the scope for competitiveness gains:

- Some countries use elastically supplied international labor, which works in non-tradable sectors meeting the consumption needs of the population. 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 contrast, albeit to a lesser extent or over a slightly longer period, appreciation would facilitate lower nominal wage payments to incoming migrants.
- In many countries, a large proportion of nationals work in the public sector, which is used as a wealth-sharing mechanism. This makes reservation wages for nationals in the private sector so high that it would take a very large devaluation for firms to become competitive. Because the resulting loss of purchasing power would place considerable pressure on the public sector to raise nominal wages, nationals would have even higher nominal private sector reservation wages. On the other side, an appreciation may lead to lower nominal wage increases, but this could be a slow adjustment and there would likely be downward nominal rigidity.

There is limited opportunity for the exchange rate to affect import volumes. 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. However, this impact may be muted if the relatively large public sector is compelled to raise nominal spending. If public sector spending is smoother than private sector spending, the relative importance of the government 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[9] and well below estimates for broader samples. Countries that have more domestic production in import-competing sectors would have more scope to substitute for imports.

[9] The authors do not reject the hypothesis of producer-currency pricing; that is, a weaker currency in the importing country translates fully into higher import prices.

The trade balance: competing volume and price effects

The sign of the impact of the exchange rate on the trade balance is theoretically ambiguous due to competing volume and price effects. 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.[10] Price effects are immediate[11] 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).

In a recent empirical study, the 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). Moreover, 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.[12] This is close to reduced form trade balance regressions for the OECD, which haves 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). Moreover, there is some evidence of a non-linear response such that elasticities are higher in episodes of large depreciations (Lee and others, 2015).

For oil exporters, the volume elasticities discussed above make it less likely that the Marshal Lerner conditions hold (in which case the trade balance semi-elasticity would be positive) or at least make the trade balance response low (the semi-elasticity would be negative but small). However, 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:

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

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

[12] Specifically, using their table 3.1, the volume effect of an appreciation of 1 percent is $\rho^x \vartheta^x s^x - \rho^m \vartheta^m s^m$, representing respectively the elasticity of foreign-currency export prices to the exchange rate, the elasticity of exports to foreign currency prices, and the share of exports in GDP in 2012 in the first term; and the elasticity of local-currency imports to the exchange rate, the elasticity of imports to import prices, and the share of imports in GDP in 2012 in the second term. The values, respectively, are 0.55, -0.32, 0.41, -0.61,-.30, and 0.42. The volume effect is -0.15, as reported by the authors. The local-currency price effect is $(\rho^x - 1)s^x - \rho^m s^m$=+0.07, resulting in a net change in the trade balance of 0.08 percent of GDP.

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

TB is the trade balance, GDP is gross domestic product, E is the exchange rate in dollars per local currency unit (a rise implies an appreciation for the oil exporter); O, N and M refer to oil exports, non-oil exports and total imports. The equation above shows the price and volume effects separately within the parenthesis.

- The numerical values indicate the price effects. In particular, an appreciation would reduce local-currency oil receipts, holding volumes constant, because oil is priced in dollars. Similarly, an appreciation would reduce the local-currency price paid for imports because they are priced in dollars. We assume non-oil exports are priced in local currency so there is no price effect.[13]
- The volume elasticities are denoted by η, which have been estimated empirically.

We draw volume elasticity estimates for oil exporters from Table 2. In particular, we take the import coefficient of 0.09. 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. 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:

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

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 will in many cases be the main reason why exchange rate changes have less of an effect on oil exporters' trade balances.

[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 estimated imperfect pass-through has a marginal net impact on the results.

- An appreciation would reduce the trade balance because of lower local-currency oil prices (and no oil volume change) and also reduce the trade balance because of lower non-oil export volumes (and no price effect). 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 precise effect will vary by country depending on its trade data. However, for illustrative purposes, assume imports equal exports (of which 67 percent are oil as per Table 1) and assume a trade/GDP ratio of 1. In this case, the semi-elasticity would be +0.00945; an appreciation of 10 percent raises the trade balance by 9.45 basis points.
- The derivative for the non-oil trade balance is likely to be positive. Excluding the first term from the right hand side of the equation makes it likely that the import effect will outweigh the export effect such that an appreciation improves the non-oil balance.
- More generally, 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. Therefore, for example, the derivative is likely to be less negative / more positive using 2015 data than 2014 data.

Other exchange rate channels

The exchange rate could affect primary (e.g. investment) income flows. Fixed income obligations in foreign currency would be affected by exchange rate changes. For example, a depreciation would likely raise existing obligations in local-currency terms and hence weaken the current account. 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 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 secondary (eg remittance) outflows in domestic currency terms. As reservation wages for migrants are set internationally, a weaker currency could 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. The magnitude of this channel is likely to be larger in the GCC, where remittance outflows are large and where the duality of the labor market is more entrenched. Holding wages constant, the impact on the proportion remitted is ambiguous. On the one hand, remitters targeting amounts in home currency would raise remittances following a depreciation in the host country. On the other hand, it makes goods and services in the home country more expensive,

which may discourage remittances. Higher nominal wages for migrants would also weaken the income-compression mechanism through which depreciations reduce imports.

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, and this may not be fully captured in the previous analytical framework. 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).

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 a broader sample of 21 global oil exporters average approximately -0.04, but they found similarly low elasticities for their sample of oil and non-oil exporters.

B. The Role of Fiscal Policy

Governments play an important role in oil exporters. Government directly accounts for a large share of domestic demand in oil exporters, especially in the more oil-dependent countries (Table 1), and its indirect impacts through state-owned enterprises and public employment are also sizeable but not captured in the data presented.

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 sector are positively correlated, then the change in the current account balance can exceed the change in government dissaving. A positive correlation

would be more feasible 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 discourage exports, although the channel is less clear 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.[14]
- The government spending multiplier is

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

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

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

[14] 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.

- 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.

There are 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.

- Government spending raises net income transfers abroad, particularly remittance outflows. Expatriate employment is responsive to economic activity (Behar, 2015), 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.
- Government spending can reduce net primary income from abroad, especially investment income flows. 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 and find a similar range for the effect of fiscal policy on the trade balance. 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 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. In particular, illustrative calibrated examples and previous empirical work suggest the responsiveness of the external accounts to changes in the exchange rate could be negligible and the elasticity with respect to government spending could plausibly be unity. This section estimates the role of the exchange rate and fiscal variables econometrically.

A. Sample

The starting point for our sample of oil exporters is the World Economic Outlook list of 29 oil exporting countries. 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, which is 1986 – 2014).[15] Based 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). The initial sample therefore consists of 24 countries with a broad regional coverage (Africa, Asia, Latin America and Middle East).

We further consider a narrow sample consisting of countries with strong reliance on oil. For this purpose, 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).

Before turning to the regressions analysis, figure 1 provides a set of charts showing the evolution of some macroeconomic indicators for the three country-groups, namely simple averages for the broad sample, the restricted sample, and the subset of GCCs, 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 group of GCC countries may explain some of this difference as they register stronger trade and current

[15] Data availability becomes severely more limited as the sample goes back earlier.

account positions than the full and the restricted samples. The difference in terms of imports is less straightforward between the latter two samples over the covered period. The fiscal stance also shows significant differences between the country groups. Fiscal balances and government spending are higher on average for the more restricted sample of oil exporters compared to the full sample, of which the GCCs record the highest average levels.

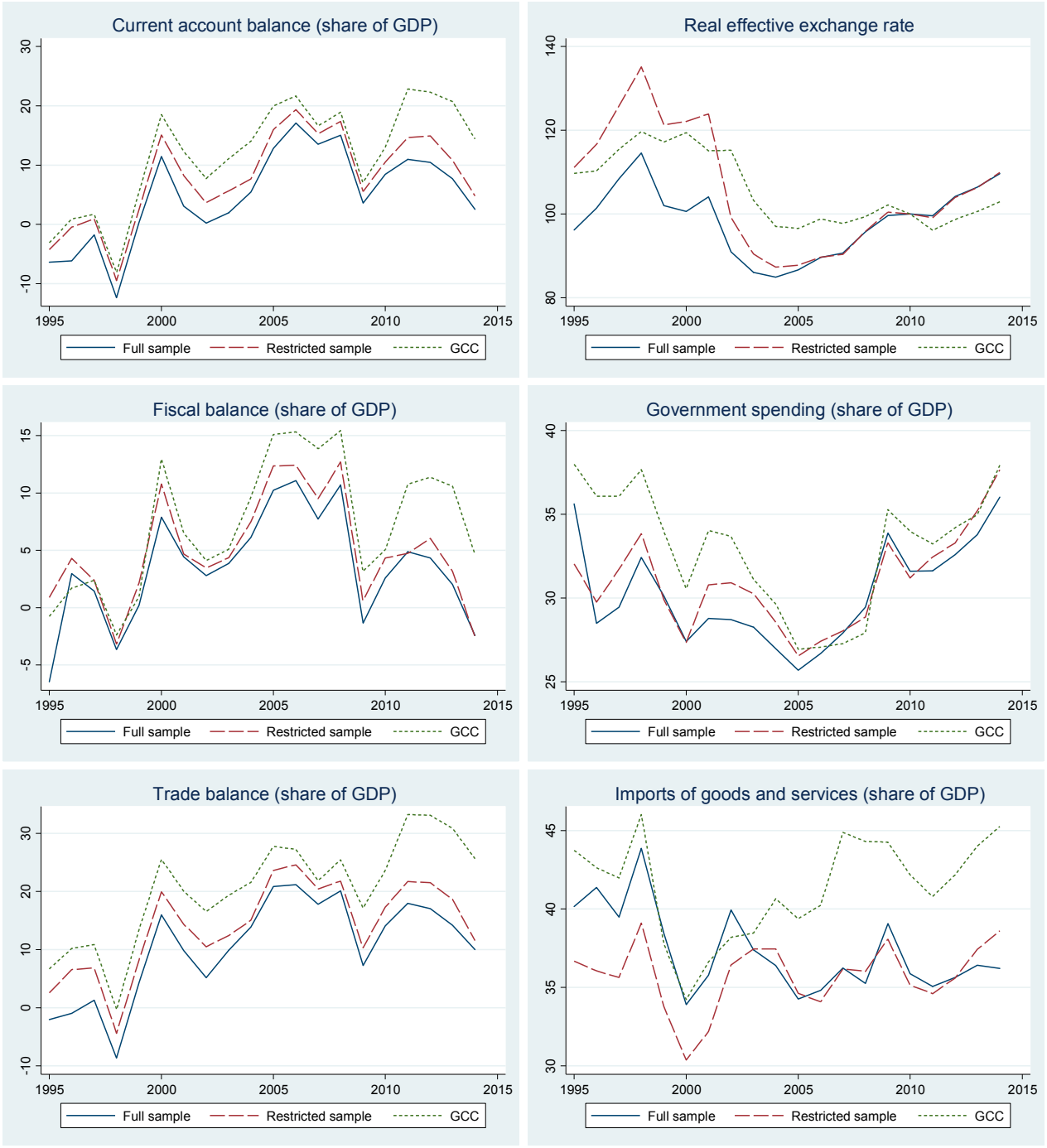
Figure 1 also provides some preliminary insights regarding the relation between exchange rate, fiscal and external adjustments, in line with our discussion in the previous section. The charts suggest a clear positive correlation between the fiscal balance and the current account or trade balance. For 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,[16] 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 – and 0.14 in the GCC.[17] On average, the appreciation since the mid 2000s coincided with a large and sustained increase in the real oil price.

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

[17] 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 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.

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



Source: World Economic Outlook, Information Notice System

B. Current account balance regressions

This section proceeds with the assessment of the current account balance responses to changes in the real effective exchange rate and the fiscal stance.

Model specification

The equation to be estimated can take the following form:

$$CAB_{it} = \gamma + X_{it}\Phi + \beta REER_{it} + \varphi fiscal_{it} + \alpha_i + \varepsilon_{it} \quad (1)$$

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 individual and time dimensions, respectively.

X is the vector of additional control variables considered as the main determinants of the current account balance. Our baseline for this set of controls is the IMF External Balance Assessment (EBA-lite) framework. The following variables are included in the current account balance regressions:[18]

- *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.

[18] 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.[19]
- *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.

The EBA-lite framework (which is based on almost 150 countries) controls for additional variables which we do not include in our main specifications for several reasons, including due to our much smaller sample.[20] Especially, *Remittances inflows to GDP* ratio and *Safer institutions/political environment* are not included because of missing data for a large proportion of the oil exporters.[21] We control for demographics by including *Dependency ratio*, while the EBA-lite also include *Aging speed* (defined as the projected change in dependency ratio). We choose to keep only one of those two indicators of demographics as we suspected they may show high co-linearity which can be a bigger issue in the relatively small sample considered in our case. The same reasoning can be applied regarding the control for productivity. The EBA-lite regressions include *Output per worker relative to the three top economies* (Germany, Japan and USA) in addition the *Relative output per worker*

[19] 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).

[20] Despite these departures from the EBA-lite framework, in our regressions we include all the EBA-lite regressors for robustness. We also follow the EBA-lite by taking deviations from global means to impose global consistency for many of the control variables. Specifically, we use the October 2015 vintage, although revised EBA-lite specifications may be updated periodically.

[21] We presented recent descriptive data on the importance of remittance outflows, but reliable time series for econometric analysis are not available.

interacted with *capital openness*. We only keep the latter. We also do not include *Output gap* as a control variable in our main specifications because this is conceptually and practically less clear for oil-exporting economies, especially those who import large quantities of labor. We further exclude foreign exchange *Reserves to GDP*, as a strong reverse causality is to be expected with the current account position. Furthermore, including reserves and net foreign assets in the same specification is likely to raise co-linearity issues between those two variables.

In the EBA-lite model, the *Resource temporariness* index is interacted with *Oil/gas trade balance*. We choose not to use this interaction and rather keep only the resource temporariness index. Indeed, oil trade balance is strongly reflected into the government revenue (especially for our restricted sample where oil revenue represents at least 50 percent of government revenue[22]). Therefore, to avoid co-linearity with fiscal variables, especially government revenue, we drop oil balance from our specifications. Finally, the *Financial center* dummy from the EBA-lite is not included in our regressions, as none of our oil exporting countries is considered as a financial center according to this classification.

Note that the set of control variables selected for our empirical investigations is 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).

As suggested in equation (1), our primary interest in this empirical analysis is in the following two variables:

Real effective exchange rate. This is one major departure from the EBA-lite framework which does not control for the potential effect of the exchange rate.[23] 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.[24]

[22] Except for Azerbaijan which has a ratio of 48 percent (averages over the covered period).

[23] The EBA-lite considers the exchange rate as a policy variable which can be used to close potential current account gaps.

[24] Our specifications control for the overall fiscal balance instead of cyclically adjusted fiscal balance as in the EBA-lite, since the latter is much less straightforward to compute for oil exporting countries.

- *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 price effects, we choose not to interpret the coefficient of revenue as the effect of discretionary government revenue decisions on the current account. [25]

  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.

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 the IMF's External Balance Assessment (EBA) methodology (Phillips, Catão, Ricci, Bems, Das, Di Giovanni, Unsal, Castillo, Lee, Rodriguez, and Vargas, 2013).[26]
- 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

[25] 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.

[26] The EBA-Lite approach also excludes country-specific fixed effects. It uses a two-stage GMM procedure that attempts to address autocorrelation, endogeneity and heteroskedasticity (Chen, 2016).

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 an over- or under-estimation of the beneficial effects of exchange rates.[27] Given the limited availability of external instruments for all potential endogenous 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. 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 both specifications where we control for the fiscal balance, as well as government spending and revenue separately (results from additional specifications including all the EBA-lite controls are presented in appendix table 4). Most of the control variables appear to significantly affect the current account balance as expected. The coefficient associated with net foreign assets is positive and significant, suggesting a positive response of the current account to increases in net foreign assets. As discussed, this effect is related to income flows associated with higher net foreign assets. Commodity terms of trade also show a positive effect on the current account position. This reflects the increase in net export receipts as a result of positive terms of trade shocks.

[27] For example, foreign capital flows, which act to appreciate a currency, could fund investment that is partially offset by imports, which weakens the current account; this would lead to an estimate of the exchange rate coefficient that is too negative, which would overstate the benefits of exchange rate adjustment. If not properly controlled for, higher oil prices could simultaneously strengthen the current account and the currency and lead to an estimate that is insufficiently negative / too positive.

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***	0.272***	1.221***	0.981***	0.793***						
	(0.177)	(0.044)	(0.036)	(0.171)	(0.053)	(0.199)						
Gov. spending							-0.099	-0.241***	-0.289***	-1.414***	-1.065***	-1.304***
							(0.149)	(0.045)	(0.105)	(0.242)	(0.066)	(0.229)
Gov. revenue							1.000***	0.444***	1.368***	0.835***	0.898***	0.738***
							(0.283)	(0.062)	(0.228)	(0.130)	(0.070)	(0.246)
L.Net foreign assets	-0.000	0.030***	0.081***	0.037**	0.030***	-0.006	-0.021	0.022**	0.000	0.042**	0.022**	0.010
	(0.044)	(0.009)	(0.016)	(0.018)	(0.009)	(0.040)	(0.048)	(0.009)	(0.012)	(0.019)	(0.010)	(0.041)
Commodity ToT*Trade_open	0.511***	0.803***	0.580***	0.274	0.438***	0.876**	0.416***	0.720***	0.369***	0.295	0.416***	1.026***
	(0.141)	(0.068)	(0.090)	(0.193)	(0.082)	(0.445)	(0.141)	(0.069)	(0.071)	(0.190)	(0.092)	(0.391)
GDP growth, forecast 5 years	-1.061**	-0.146	-2.098***	-0.927***	-0.496**	-3.730**	-0.658*	-0.228	-0.805	-1.313***	-0.664***	-1.325
	(0.443)	(0.190)	(0.344)	(0.278)	(0.215)	(1.463)	(0.375)	(0.197)	(0.732)	(0.297)	(0.236)	(1.740)
Dependency ratio	0.196	0.220**	1.535***	0.474	0.226	-0.374	0.234	0.161	0.672	0.643	0.239	1.456*
	(0.623)	(0.099)	(0.414)	(0.524)	(0.144)	(0.816)	(0.619)	(0.113)	(1.120)	(0.567)	(0.162)	(0.811)
L.Output per worker*K.open	-0.075	0.018	0.002	-0.106*	-0.026	0.045	-0.061	0.001	0.009	-0.136**	-0.027	0.134**
	(0.053)	(0.025)	(0.071)	(0.059)	(0.024)	(0.042)	(0.055)	(0.028)	(0.051)	(0.058)	(0.025)	(0.057)
Demeaned private credit/GDP	-0.268***	-0.201***	-0.075	-0.093*	-0.143***	-0.252***	-0.178***	-0.184***	-0.101*	-0.112**	-0.162***	-0.196
	(0.079)	(0.033)	(0.074)	(0.047)	(0.033)	(0.090)	(0.068)	(0.033)	(0.056)	(0.049)	(0.037)	(0.162)
Aid/GDP	0.945	-0.336	1.046***	-0.796**	-0.627**	2.185	0.276	-0.470*	0.591	-0.793*	-0.532*	1.711
	(1.199)	(0.252)	(0.311)	(0.355)	(0.281)	(2.036)	(0.990)	(0.250)	(0.775)	(0.443)	(0.306)	(2.406)
Oil resource temporariness	0.038***	-0.001	0.037***	0.336	-1.579	10.599	0.031***	0.004	0.046	0.028***	0.012	0.044
	(0.011)	(0.007)	(0.009)	(2.046)	(1.339)	(9.058)	(0.010)	(0.007)	(0.032)	(0.009)	(0.007)	(0.045)
Ln(REER)	-2.528	-4.064***	-6.478	0.026***	0.011	0.058***	3.556	-5.513***	6.679	-5.391**	-2.693*	-0.704
	(2.650)	(1.442)	(8.001)	(0.009)	(0.007)	(0.015)	(3.210)	(1.485)	(8.222)	(2.517)	(1.595)	(12.671)
L.current account balance			-0.006			-0.144**			0.019			0.211
			(0.052)			(0.069)			(0.140)			(0.251)
Constant	16.773	22.274***	52.218	6.815	12.174*	-56.358	-14.636	28.338***	-24.162	37.561**	17.313**	23.127
	(17.968)	(6.559)	(39.214)	(13.182)	(6.587)	(54.706)	(22.698)	(6.787)	(45.575)	(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	.	.	0.821	.	.	0.231	.	.	0.996	.	.	0.386
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 two first lags, to avoid the risk of "too many instruments". P values of chi2 and Hansen J tests 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 J test of overidentifying restrictions tests the null hypothesis that the instruments are valid.

GDP growth forecast in 5 years is found to be negatively correlated with the current account balance. We argued that this has to do with the increase in foreign capital flows and/or depletion of national saving required for growth financing in countries with high growth prospects. Credit to the private sector and aid also have a negative effect on the current account balance. As discussed, the increase in credit to the private sector and aid flows can contribute to boost domestic demand, including for imported goods and services. Aid flows also deteriorate the current account balance through the net transfers position. The response of the current account to oil resource temporariness is positive, in line with the intuition that countries in which oil resources are expected to exhaust sooner tend to save more. Relative output per worker does not seem to affect the current account balance, as the associated coefficient is not statistically significant in almost all the specifications. Finally, dependency ratio shows a significant (but not robust) coefficient, although with the unexpected sign.

Regarding the current account response to real exchange rate changes, our findings evidence a relatively low or even non-significant effect, depending on the country group and the specification considered. At best, 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 and 6 (suggesting that currency depreciation may deteriorate the current account balance) are very low in magnitude.[28]

Turning to the role of fiscal policy, 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 (including the GCCs) will increase the current account balance by about 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 stronger for the more oil-dependent oil exporters. A 1 pp. increase in government spending deteriorates the current account position by up to 0.3 pp. of GDP for the broad sample of oil exporting countries. For the more oil-dependent economies and GCC, the current account deteriorates by about 1.2 pp. following a 1 pp. increase in government spending. Our results regarding the

[28] A 1 percent currency depreciation leads to a deterioration of the current account balance by 0.0002 to 0.0006 pp. of GDP.

restricted sample are also consistent with the data that the government plays a more important role in most oil-dependent oil exporting countries, and that the marginal propensity to import is higher in these economies. The finds 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.

We also estimated regressions for the specific sample of GCC countries.[29] The results presented in appendix table 5 suggest that the current account improves (deteriorates) by more than 1 pp. of GDP, in response to a 1 pp. increase in the fiscal balance (government spending). The magnitude of the coefficient is higher than is the case of the restricted sample. This is consistent with the theoretical discussion and descriptive statistics in Table 1 and Figure 1. However, the coefficient on government spending is potentially overestimated due to the small size of the GCC subsample.[30] The results in appendix table 5 also suggest that the response of the current account balance to REER is either not statistically significant or positive for the GCC countries.

C. Trade balance regressions

As discussed earlier, exchange rate changes and government fiscal position are expected to affect the current account mainly, but not exclusively through the trade balance. The aim of this section is to provide some evidence in this regard by estimating a trade balance equation.

Model specification

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

$$TB_{it} = \gamma + Z_{it}\Omega + \delta REER_{it} + \varphi fiscal_{it} + \alpha_i + \upsilon_{it} \quad (2)$$

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. As for the current account balance equation, we are particularly interested in assessing the effect of real effective exchange rate changes and fiscal variables on the trade balance.

Vector Z (the set of controls) includes the same variables considered for the current account regressions, as specified in equation (1), except dependency ratio. Equation (2) is also estimated for the full and restricted samples separately. This allows assessing the extent to which trade balance responses to exchange rate changes and fiscal stance depend on the degree of oil-dependence.

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[29] A different approach to assess the specific case of the GCC includes a GCC dummy as well as interaction terms in regressions with the full or the restricted sample. We reached the same conclusion with this approach. Results are available on request.

[30] Moreover, the coefficients were not robust to the choice of estimation period. This was not the case for regressions on the broad or restricted samples.

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***	0.798***						
	(0.103)	(0.035)	(0.037)	(0.027)	(0.034)	(0.103)						
Gov. spending							-0.108	-0.126***	-0.340***	-0.837***	-0.733***	-0.966***
							(0.091)	(0.036)	(0.097)	(0.068)	(0.048)	(0.338)
Gov. revenue							0.806***	0.527***	0.398	0.828***	0.686***	0.300**
							(0.140)	(0.055)	(0.316)	(0.085)	(0.066)	(0.121)
L.Net foreign assets	-0.001	-0.004	0.002	0.023**	-0.006	0.004	-0.015	-0.010	0.005	0.015	-0.022**	0.065
	(0.019)	(0.007)	(0.007)	(0.010)	(0.009)	(0.019)	(0.019)	(0.007)	(0.023)	(0.011)	(0.010)	(0.104)
Oil resource temporariness	0.025**	0.008	0.035***	0.015*	0.016*	0.031	0.021**	0.013	0.036*	0.017*	0.015	0.044
	(0.010)	(0.009)	(0.008)	(0.009)	(0.009)	(0.032)	(0.009)	(0.009)	(0.019)	(0.009)	(0.010)	(0.066)
Commodity ToT*Trade_open	0.625***	0.744***	0.251***	0.757***	0.568***	0.062	0.550***	0.592***	0.336***	0.651***	0.538***	1.628
	(0.100)	(0.063)	(0.039)	(0.106)	(0.071)	(0.328)	(0.096)	(0.063)	(0.110)	(0.123)	(0.080)	(2.470)
L.Relative Output per worker	-0.007	0.105***	0.062***	-0.152***	0.090***	0.051	-0.027	0.080***	0.000	-0.154***	0.090***	0.112
	(0.081)	(0.025)	(0.011)	(0.028)	(0.023)	(0.033)	(0.069)	(0.024)	(0.034)	(0.030)	(0.025)	(0.079)
Demeaned private credit/GDP	-0.244***	-0.253***	-0.160***	-0.101***	-0.213***	-0.013	-0.160***	-0.243***	-0.186***	-0.100**	-0.240***	-0.553
	(0.042)	(0.037)	(0.040)	(0.038)	(0.038)	(0.075)	(0.035)	(0.036)	(0.040)	(0.041)	(0.042)	(1.107)
Aid/GDP	0.013	-0.397*	0.330	-0.632*	-0.415*	-1.697	-0.478	-0.517**	1.022	-0.561	-0.483*	2.343
	(0.664)	(0.227)	(0.251)	(0.351)	(0.237)	(3.574)	(0.602)	(0.213)	(0.765)	(0.356)	(0.251)	(6.957)
GDP growth, forecast 5 years	-1.055***	-0.222	-1.371***	-1.134***	-0.479**	-1.404	-0.824***	-0.344*	-3.346	-1.263***	-0.560**	-2.925
	(0.312)	(0.198)	(0.446)	(0.278)	(0.229)	(1.427)	(0.276)	(0.195)	(2.252)	(0.289)	(0.243)	(4.859)
Ln(REER)	-5.754***	-5.595***	-7.860**	-3.677**	-0.578	-11.840	-1.883	-5.516***	-14.477	-5.068**	-1.263	-16.372
	(1.885)	(1.548)	(3.204)	(1.611)	(1.663)	(13.848)	(2.007)	(1.580)	(10.383)	(2.035)	(1.842)	(11.373)
L.trade balance			0.244***			0.258			0.197***			-0.173
			(0.044)			(0.205)			(0.070)			(0.810)
Constant	31.561***	30.112***	39.515***	19.503**	8.798	62.681	10.612	29.652***	71.483	25.438**	12.201	75.797
	(9.584)	(7.032)	(14.344)	(8.001)	(7.735)	(68.632)	(9.988)	(7.167)	(48.180)	(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	.	.	0.941	.	.	0.944	.	.	0.305
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 two first lags, to avoid the risk of "too many instruments". P values of chi2 and Hansen J tests 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 J test of overidentifying restrictions tests the null hypothesis that the instruments are valid.

The econometric approach follows the discussion for current account regressions and relies on OLS panel fixed effects, GLS with AR(1) correction, and GMM-systems approaches.

Estimation results

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. An improvement in the commodity terms of trade is associated with a higher trade balance. Credit to the private sector and aid to GDP ratios have a negative impact on the trade balance. As argued earlier, this effect likely operates through higher domestic demand, including demand for imports. In line with findings from current account regressions, table 4 evidences a negative correlation between the economic growth forecast and the trade balance. As expected, the coefficient associated with output per worker is positive,[31] suggesting that more competitive economies tend to register a higher trade balance. The positive effect of oil resource temporariness on the trade balance is also in line with our discussion and the results from current account regressions. Net foreign assets do not seem to significantly affect the trade balance.

Regarding the sensitivity of the trade balance to real exchange rate changes, the results suggest a low response. 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 positive effects of currency depreciation on income outflows through the current account.

Those results are consistent with our earlier conclusion that (*i*) the response of current accounts to exchange rate changes is relatively low for oil exporting countries in general, and (*ii*) much lower (or even not significant) for the more oil-dependent countries. Trade balance regressions for the GCCs show no statistically significant response of trade balances to changes in real effective exchange rates (appendix table 6).

The trade balance response to changes in the fiscal balance is found to be much higher, compared to the exchange rate effect. 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 balances by around 0.7 pp. of GDP. When assessing separately the effect of government spending on the trade balance, the response is also much stronger for the more oil-dependent oil exporters. For the broad sample, a 1 pp. increase in government spending deteriorates the trade balance by about 0.2 pp. For the restricted sample, the response of trade balance is 0.8 pp, and a similar response is estimated for the GCC subsample.

[31] Except in the fixed effects specification for the restricted sample, where a counterintuitive negative sign is found.

Compared to results from current account regressions, trade balance responses to fiscal balances or government spending are lower. This is in line with our theoretical argumentation that fiscal policy also affects the current account balance through net income outflows.

D. Robustness checks

This section proceeds with some robustness analyses of the empirical framework developed above. First we use the nominal instead of the real exchange rate. Second, we discuss bivariate regression results. Third, we reassess the relation between the exchange rate, fiscal policy, and the current account in a framework where we attempt to exclude potential effects translating through oil revenue or oil exports. Although we conduct a number of robustness 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. This is in line with our conclusion that the exchange rate has little impact on external balances for oil exporters.

Bivariate regressions

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 the fiscal variables. If a weaker currency can reduce government spending and raise government (oil) revenue, then it could operate through this indirect channel.[32] 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, the coefficients are statistically insignificant. These results suggest that the indirect channel is not operating.

[32] 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.

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***	0.250***	1.176***	0.955***	0.699***	0.157	0.240***	0.339***	0.792***	0.728***	0.572***
	(0.186)	(0.044)	(0.053)	(0.168)	(0.054)	(0.236)	(0.108)	(0.034)	(0.055)	(0.021)	(0.028)	(0.113)
L.Net foreign assets	-0.028**	-0.016**	-0.020**	-0.014**	-0.014**	-0.052**	-0.009	-0.011*	-0.014***	-0.001	-0.004	-0.022
	(0.011)	(0.007)	(0.008)	(0.006)	(0.006)	(0.025)	(0.007)	(0.006)	(0.004)	(0.005)	(0.005)	(0.015)
Oil resource temporariness	0.034***	0.007	0.026**	0.020**	0.007	0.045**	0.022**	0.007	0.029***	0.012	0.001	0.032*
	(0.012)	(0.008)	(0.012)	(0.008)	(0.008)	(0.018)	(0.010)	(0.008)	(0.010)	(0.008)	(0.009)	(0.019)
Commodity ToT*Trade_open	0.534***	0.777***	0.813***	0.371**	0.493***	0.678***	0.626***	0.767***	0.349***	0.802***	0.615***	-0.538
	(0.134)	(0.070)	(0.039)	(0.183)	(0.081)	(0.213)	(0.101)	(0.060)	(0.044)	(0.103)	(0.066)	(0.634)
GDP growth, forecast 5 years	-0.877*	-0.019	-1.100**	-0.720***	-0.471**	-3.388*	0.027	-0.105***	0.118***	-0.104***	-0.102***	0.136**
	(0.462)	(0.208)	(0.544)	(0.274)	(0.230)	(1.927)	(0.078)	(0.033)	(0.013)	(0.029)	(0.033)	(0.053)
Dependency ratio	-0.365	0.454	1.000*	-0.236	0.208	-0.723						
	(0.699)	(0.390)	(0.511)	(0.462)	(0.392)	(0.975)						
L.Relative Output per worker	0.003	-0.073**	0.131***	-0.032	-0.085*	0.125***	0.027	-0.105***	0.118***	-0.104***	-0.102***	0.136**
	(0.057)	(0.037)	(0.021)	(0.055)	(0.044)	(0.037)	(0.078)	(0.033)	(0.013)	(0.029)	(0.033)	(0.053)
Demeaned private credit/GDP	-0.297***	-0.221***	-0.320***	-0.201***	-0.222***	0.000	-0.252***	-0.190***	-0.199***	-0.204***	-0.198***	0.077
	(0.053)	(0.035)	(0.095)	(0.065)	(0.037)	(0.217)	(0.045)	(0.032)	(0.028)	(0.042)	(0.033)	(0.200)
Aid/GDP	0.875	-0.361	0.487	-0.924**	-0.387	2.322	0.030	-0.410*	0.911**	-0.672**	-0.527**	0.899
	(1.337)	(0.276)	(0.393)	(0.373)	(0.336)	(2.852)	(0.717)	(0.218)	(0.356)	(0.317)	(0.242)	(1.184)
Ln(NEER)	-1.363	-1.148	-3.253**	0.081	0.421	-9.241	-0.853	-1.114*	-1.147	0.441	0.125	-8.828
	(1.650)	(0.789)	(1.428)	(1.289)	(0.928)	(5.721)	(1.089)	(0.656)	(1.326)	(0.767)	(0.754)	(7.415)
L.current account balance			0.052			0.021						
			(0.046)			(0.054)						
L.trade balance									0.131***			0.530**
									(0.038)			(0.239)
Constant	2.959	14.249*	29.412**	-3.444	1.791	36.912*	8.707	7.678*	8.551	-0.685	0.945	50.935
	(15.020)	(7.847)	(11.466)	(8.766)	(7.570)	(20.430)	(5.692)	(4.197)	(6.382)	(4.268)	(4.184)	(39.355)
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	.	.	0.967	.	.	1	.	.	0.548	.	.	0.900
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 10% 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 two first lags, to avoid the risk of "too many instruments". P values of chi2 and Hansen J tests 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 J test of overidentifying restrictions tests the null hypothesis that the instruments are valid.

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 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.[33] The size of the country sample used for this exercise is only 16 due to limited availability of oil-related data. Hence, 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, suggesting that currency depreciation worsen the non-oil current account. This is consistent with our discussion on oil-exporters' characteristics in the context of the Marshall Lerner conditions. 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.

Regarding the non-oil current account response to changes in the non-oil fiscal position, 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. In any case, our argument that fiscal policy strongly affects the external adjustment in oil-exporters is further supported by this new set of results.

[33] The non-oil fiscal balance is computed by excluding oil revenue from the overall fiscal balance, and the non-oil current account balance excludes 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. For this reason, it is not our preferred measure.

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
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 two first lags, to avoid the risk of "too many instruments". P values of chi2 and Hansen J tests 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 J test of over-identifying restrictions tests the null hypothesis that the instruments are valid.

Overall, the results from the empirical analysis are in line with our (theoretical) discussion on the relation between the current account balance, exchange rate and fiscal policy in oil exporting countries. We find that the current account response to exchange rate changes is very low in those countries in general. For the most oil-dependent oil exporting countries including the GCCs, the current account is not affected by the real effective exchange rate. On the contrary, government policy through its fiscal decisions can have a significantly large impact on the current account balance, especially in more oil-dependent economies including the GCCs.

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.[34]

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 and less for the restricted sample. 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 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 estimating 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 including the GCCs, the role of government is bigger. Trade balance elasticities are 0.8 while current account elasticities are 1.2 for the restricted sample. We do not find evidence that exchange rates operate indirectly through fiscal channels. As motivated in our analytical discussion, these estimates are higher than for broader samples of countries.

Our analysis suggests that, if current account adjustments are required in oil exporting countries, those adjustments are less likely to be 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.

However, when making this comparison, it is important to consider other costs and benefits of the two approaches beyond the current account. A fiscal consolidation would bring with it a potentially procyclical reduction in aggregate demand. In contrast, a weaker currency would boost economic activity by raising net exports, although the volume elasticities

[34] Discussing the choice of exchange rate regime, each of which has numerous pros and cons for broader economic performance and not only external adjustment, is beyond the scope of this paper.

discussed earlier would make the impact less beneficial for oil exporters than for other economies. A weaker currency could also impair balance sheets if foreign currency liabilities exceed foreign currency assets. Moreover, the effects of currency depreciation or devaluation on the financial account in the balance of payments would need to be considered.

A possible extension of the role of fiscal policy is to disaggregate the empirical analysis into various expenditure components, distinguishing for example between capital spending (which may have a large import component), implicit or explicit energy subsidies (which could boost domestic consumption at the cost of oil exports), and other items. Alternatively, the potential for fiscal consolidation to bring about a real (but not nominal) depreciation in oil exporters merits additional consideration.

The analysis of exchange rate impacts presented here could usefully be complemented by examination of large exchange rate depreciation episodes in oil exporters. For a broad sample of countries, Leigh and others (2015) estimate export elasticities with respect to the exchange rate in these episodes that are larger than in their traditional export equations, but are unable to separately identify significant import responses. For emerging markets, Gervais and others (2016) find that current account deficit reversal episodes are associated with exchange rate changes. However, the associated exchange rate changes are large, and the relationship is stronger in the context of an exchange rate crisis, which suggests other factors are at play.

It may be challenging to find enough examples for econometric purposes, which may prompt case studies[35] of current account adjustment in oil exporters. Alternatively, vector error correction model (VECM) analysis (Gervais and others, 2016) or structural vector autoregression (SVAR) estimations for a handful of individual countries could be informative.

Our analysis has been from the perspective of oil exporters but does not discuss multilateral implications. There could be important spillovers to major trading partners, migrants' home countries, asset markets, as well as to global current account imbalances.

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. In this spirit, rather than conducting the analysis with separate samples of oil or commodity exporters, it may be instructive to start with a broad cross-section and identify which economic characteristics explain why the effectiveness of fiscal policy or the exchange rate varies across countries. For example, responses to exchange rate changes may be higher in more diversified economies.

[35] There are cases of current account adjustment in oil exporters coinciding with exchange rate adjustment.

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
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	EBA-lite template
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
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.

Appendix Table 4. Current Account Regressions – Including all the EBA-Lite Regressors

Dependent Variable: Current Account Balance (Percent of GDP)

	Full sample			Restricted sample		
	Panel FE	GLS	GMM-syst.	Panel FE	GLS	GMM-syst.
	(1)	(2)	(3)	(4)	(5)	(6)
Cyclically adjusted fiscal balance	0.392***	0.375***	0.538*	0.352***	0.444***	-0.389
	(0.096)	(0.058)	(0.326)	(0.132)	(0.075)	(0.657)
L.Net foreign assets	0.070***	0.043***	0.106**	0.076***	0.033***	0.211**
	(0.012)	(0.008)	(0.051)	(0.022)	(0.013)	(0.102)
Commodity ToT*Trade_open	0.698***	0.666***	-0.616	0.708***	0.589***	0.592
	(0.151)	(0.076)	(0.493)	(0.188)	(0.102)	(1.703)
GDP growth, forecast in 5 years	-0.541**	-0.290	-1.919*	-0.596**	-0.468*	0.310
	(0.211)	(0.196)	(1.050)	(0.252)	(0.273)	(1.140)
Dependency ratio	0.235	0.348***	0.568	1.191	0.508**	1.108
	(0.481)	(0.110)	(0.544)	(0.811)	(0.243)	(1.707)
L.Output per worker*K._open	0.049	0.014	0.695	-0.112	0.079	1.021
	(0.134)	(0.071)	(0.536)	(0.186)	(0.096)	(0.893)
Demeaned private credit/GDP	0.045	-0.096***	0.112	0.090	-0.101**	0.070
	(0.044)	(0.032)	(0.173)	(0.075)	(0.049)	(0.544)
Aid/GDP	-0.716***	-0.737***	-1.320	-0.737**	-0.497*	0.000
	(0.259)	(0.235)	(1.247)	(0.307)	(0.286)	(0.000)
Ln(REER)	-2.837	-6.610***	3.533	-1.350	-4.694***	0.000
	(2.043)	(1.461)	(9.863)	(2.597)	(2.347)	(0.000)
ΔReserves/GDP*K._controls	0.485***	0.569***	0.443	0.585***	0.684***	-0.161
	(0.145)	(0.089)	(0.785)	(0.166)	(0.114)	(0.750)
Remittances/GDP	1.227***	0.597***	1.323	1.398***	0.578***	0.000
	(0.218)	(0.146)	(0.949)	(0.301)	(0.170)	(0.000)
Output gap	0.218**	-0.008	0.738**	0.181	-0.044	0.264
	(0.103)	(0.063)	(0.330)	(0.173)	(0.088)	(0.276)
Institutions/political environment	-0.221***	-0.102**	-0.499**	-0.215**	-0.163*	-0.861
	(0.069)	(0.048)	(0.241)	(0.104)	(0.084)	(0.632)
L.Output per worker (top 3 eco.)	-0.173	0.094	-0.559	-0.092	0.039	-0.803
	(0.139)	(0.059)	(0.514)	(0.183)	(0.078)	(0.869)
Oil, gas trade B.*resource temp.	0.445***	0.205***	-0.139	0.644***	0.155	-0.193
	(0.131)	(0.070)	(0.154)	(0.200)	(0.096)	(0.517)
Aging speed	-0.189	-0.018	0.458	-0.468*	0.222	-0.869
	(0.242)	(0.150)	(0.600)	(0.275)	(0.217)	(1.812)
L.CAB			-0.083			-0.838
			(0.199)			(0.519)
Constant	2.677	31.523***	-12.636	5.475	27.382***	0.000
	(14.566)	(6.540)	(46.981)	(17.909)	(7.841)	(0.000)
Observations	301	298	94	181	178	57
Adjusted R-squared	0.761	.	.	0.778	.	.
Wald chi2 stat.	.	0	0	.	0	0
Hansen J test	.	.	0.978	.	.	0.194
Number of country	18	18	18	11	11	11

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 two first lags, to avoid the risk of "too many instruments". P values of chi2 and Hansen J tests 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 J test of overidentifying restrictions tests the null hypothesis that the instruments are valid.

Appendix Table 5. Current Account Regressions – GCC Countries

	Dependent Variable: Current Account Balance (Percent Of GDP)								
	Panel Fixed Effects			GLS			2SLS		
	EBA-lite			EBA-lite			EBA-lite		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Cyclically adjusted fiscal balance	0.063			0.372***			0.059		
	(0.161)			(0.136)			(0.216)		
Fiscal balance		1.224***			1.170***			1.212***	
		(0.129)			(0.066)			(0.061)	
L.Net foreign assets	-0.163**	0.008	0.019	-0.008	0.038***	0.021	0.021	0.247	0.119
	(0.060)	(0.035)	(0.031)	(0.046)	(0.014)	(0.015)	(0.057)	(0.272)	(0.092)
Commodity ToT*Trade_open	0.671*	-0.327	-0.053	0.429**	-0.187	-0.083	0.676**	0.056	0.258
	(0.337)	(0.257)	(0.219)	(0.217)	(0.159)	(0.171)	(0.317)	(0.402)	(0.434)
GDP growth, forecast in 5 years	-1.057	-1.326	-1.219	-0.076	-0.726*	-0.567	-1.069	-1.996**	-1.588**
	(1.003)	(0.870)	(0.760)	(0.647)	(0.437)	(0.436)	(0.834)	(0.858)	(0.726)
Dependency ratio	6.606*	-1.031	-1.527**	-1.385	-0.449	-0.206	6.830*	0.001	-0.875
	(3.195)	(0.718)	(0.701)	(1.797)	(0.427)	(0.464)	(3.489)	(1.252)	(1.114)
L.Output per worker*K._open	-0.763*	-0.084	-0.097	-0.223	-0.072**	-0.065*	-0.774*	-0.180*	-0.159*
	(0.404)	(0.061)	(0.059)	(0.279)	(0.036)	(0.036)	(0.414)	(0.096)	(0.087)
Demeaned private credit/GDP	-0.665	-0.417***	-0.361***	-0.540*	-0.425***	-0.470***	-0.668*	-0.060	-0.119
	(0.387)	(0.114)	(0.109)	(0.282)	(0.108)	(0.113)	(0.343)	(0.325)	(0.309)
Aid/GDP	-2.428*	-2.742**	-2.553*	-4.244***	-2.920***	-3.413***	-2.369	2.535	0.928
	(1.315)	(1.201)	(1.312)	(1.336)	(1.074)	(1.187)	(1.705)	(4.918)	(4.559)
Ln(REER)	-11.746	1.671	-1.081	-6.220	12.232**	12.474*	-13.786	-53.699	-37.369
	(10.480)	(6.099)	(5.966)	(12.118)	(5.825)	(6.543)	(13.152)	(46.022)	(42.930)
Oil resource temporariness		0.006	0.000		0.013	-0.001		0.014	0.005
		(0.007)	(0.006)		(0.009)	(0.009)		(0.018)	(0.016)
ΔReserves/GDP*K._controls	0.449			0.486			0.441		
	(0.534)			(0.408)			(0.522)		
Remittances/GDP	-5.016			21.537**			-4.615		
	(28.195)			(10.235)			(22.406)		
Output gap	-0.033			-0.030			-0.006		
	(0.369)			(0.336)			(0.398)		
Institutions/political environment	-0.101			-0.064			-0.103		
	(0.241)			(0.228)			(0.263)		
L.Output per worker (top 3 eco.)	0.770*			0.211			0.417		
	(0.431)			(0.317)			(0.480)		
Oil, gas trade B.*resource temp.	1.538			-0.589			0.069		
	(0.913)			(0.405)			(0.180)		
Aging speed	0.799			-0.836			1.302		
	(1.463)			(0.608)			(1.182)		
Gov. spending			-1.566***			-1.407***			-1.583***
			(0.152)			(0.080)			(0.076)
Gov. revenue			0.450**			0.875***			0.325
			(0.182)			(0.100)			(0.215)
Constant	128.111	-24.357	-27.995	11.135	-67.928**	-60.864*	201.655*	264.756	172.534
	(97.598)	(39.638)	(37.787)	(83.264)	(31.894)	(35.848)	(116.015)	(242.365)	(227.014)
Observations	42	127	127	39	127	127	42	127	127
Adjusted R-squared	0.907	0.891	0.895	.	.	.	0.579	.	0.255
Wald chi2 stat.	.	.	.	0	0	0	0	0	0
Number of country	3	6	6	3	6	6	3	6	6

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 2SLS estimates use the bilateral exchange rate against the US dollar as instrument for the REER. P values of Wald chi2 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.

Appendix Table 6. Trade Balance Regressions – GCC Countries

	Dependent Variable: Trade Balance (Percent of GDP)					
	Panel FE		GLS		2SLS	
	(1)	(2)	(3)	(4)	(5)	(6)
Fiscal balance	0.729***		0.658***		0.717***	
	(0.030)		(0.033)		(0.098)	
Gov. spending		-0.852***		-0.805***		-0.716***
		(0.050)		(0.043)		(0.184)
Gov. revenue		0.539***		0.391***		1.061**
		(0.127)		(0.073)		(0.481)
L.Net foreign assets	-0.002	0.002	-0.003	-0.005	0.035	0.046
	(0.010)	(0.012)	(0.011)	(0.011)	(0.039)	(0.048)
Oil resource temporariness	-0.007	-0.008	0.004	-0.003	-0.026	-0.026
	(0.006)	(0.006)	(0.008)	(0.007)	(0.029)	(0.035)
Commodity ToT*Trade_open	0.358**	0.356*	0.218**	0.359***	-0.554	-1.036
	(0.150)	(0.198)	(0.100)	(0.111)	(0.689)	(1.026)
L.Output per worker (top 3 eco.)	-0.138***	-0.149***	-0.038	-0.042	0.042	0.060
	(0.030)	(0.035)	(0.030)	(0.029)	(0.139)	(0.168)
Demeaned private credit/GDP	-0.187**	-0.194**	-0.415***	-0.425***	-1.178*	-1.441*
	(0.077)	(0.079)	(0.087)	(0.087)	(0.652)	(0.841)
Aid/GDP	-4.127***	-4.335***	-2.895***	-3.129***	-18.301*	-21.781*
	(0.994)	(1.086)	(0.896)	(0.942)	(9.516)	(12.005)
GDP growth, forecast in 5 years	-0.109	-0.121	0.011	0.039	1.506	1.541
	(0.374)	(0.414)	(0.337)	(0.331)	(1.438)	(1.651)
Ln(REER)	-3.092	-2.824	6.431	4.934	135.287	167.124
	(4.029)	(4.433)	(5.801)	(6.085)	(86.309)	(109.401)
Constant	41.636**	38.718*	-15.778	-6.387	-628.810	-787.418
	(19.505)	(21.442)	(28.137)	(29.448)	(415.153)	(529.899)
Observations	127	127	127	127	127	127
Adjusted R-squared	0.886	0.862	.	.	.	.
Wald chi2 stat.	.	.	0	0	0	0
Number of ID	6	6	6	6	6	6

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 2SLS estimates use the bilateral exchange rate against the US dollar as instrument for the REER. P values of Wald chi2 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.

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