The Twin Deficit Hypothesis in the MENA Region: Do Geopolitics Matter?

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Abstract: This paper examines the relationship between fiscal and external balances in MENA oil versus non-oil countries in the context of the twin deficits hypothesis (TDH) using Panel Vector Autoregression- Generalized Methods of Moments PVAR GMM estimation, Granger Causality and IRFs. The essence of this analysis is to assess the vulnerability of fiscal and external balances to oil price dynamics and regional geopolitics in the region. Results show that a twin-deficit problem exists in MENA oil-rich countries only while the problem does not exist in non-oil ones. This affirms the hypothesis that oil dependence results in high fiscal vulnerability to geopolitical shocks that automatically transmits to external balances. While a TDH isn't proven to exist in non-oil countries, fiscal and external balances problems result from longstanding structural factors. A high reliance on tourism revenues and remittances as main sources of foreign currency receipts (together with poor tax administration and enlarged current spending bills) makes those countries more vulnerable to domestic and external shocks; reflected in both growing fiscal and current account deficits. A large imports sector and relatively poor exporting capacity also contribute to weakening external accounts. The main policy recommendations for MENA oil-rich countries rely in the importance of strengthening the non-oil sector in order to diversify domestic sources of revenues. Adopting flexible exchange rates is recommended to decrease the vulnerability of the external shocks to oil price dynamics. For non-oil MENA regions, fiscal consolidation, reforming current spending and strengthening tax administrations are crucial to improve fiscal performance. Export-led growth strategies and inclusive growth policies would also contribute to improving external accounts in the examined economies.

Keywords: twin deficit hypothesis; budget balance; current account balance; MENA region; oil countries; non-oil countries; PVAR modeling

1. Introduction

The relation between fiscal and current account balances has been proposed in contemporary economic theory and examined widely in empirical literature under the commonly known term "twin deficit hypothesis (TDH)". According to the Keynesian proposition, budget deficit (BD) has an impact on current account deficit (CAD) through the absorption theory, where an expansionary fiscal policy would expand the aggregate demand and the domestic absorption for imports in the economy which will worsen the current account deficit (CAD) (Abell 1990). Budget deficit affects the economy through high interest rates, low savings and low economic growth. This hypothesis constituted the basis for the Mundell–Fleming framework (Nargelecekenlera and Giray 2013). The TDH has been widely examined in literature, and different results exist relative to the presence and the direction of the relation between budget deficit and current account deficit. The twin deficit hypothesis is particularly relevant to the MENA region characterized by identified fiscal and monetary problems, resulting either from structural reasons or from the oil-based structures in some of those countries. In this paper, we investigate the twin deficit hypothesis in the MENA region by empirically examining the relation between fiscal balance

and external account balance in 10 MENA countries. We group the sample countries into two groups: oil countries versus non-oil countries. This distinction is essential, as the MENA region has been affected by many factors in the past decades (such as oil prices, economic structure and state policies (Aristovnik 2007). Moreover, some MENA region countries already suffer from longstanding fiscal deficit and accumulated debt as well as poor external balance. We cover the period spanning from 1990s–2018 where most of the sample countries started structural economic reforms and adjustments programs after the 1970s oil crises and the Arab–Israeli war. The remainder of the paper is organized as follows: section two briefs the twin deficit hypothesis in theory and reviews some relevant literature. In section three, we present the analysis of the TDH in both oil and non-oil MENA countries using empirical methods and descriptive analysis. Finally, section four concludes and states some policy recommendations.

2. The Twin Deficit Hypothesis Resource-Rich Economies: Theory and Literature

The TDH was originally examined by Milne (1977), where he found that there exists a positive relation between the two deficits using a simple single equation model where budget deficit was found to affect current account deficit. More recent works involved rather advanced regression tools such as vector autoregressive models (VAR) (used in Abell (1990) and Enders and Lee (1990), who examined the TDH in the U.S. economy and came up with mixed findings on the existence of TDH in the U.S. economy). The main arguments related to the twin deficit are the (1) Keynesian proposition, which is a proponent to the twin convergence where the budget deficit causes the current account deficit and the (2) Ricardian equivalence hypothesis (REH), which supports the twin divergence where there is no link between the two deficits.

The Keynesian proposition—later employed in the Mundell–Fleming framework—relies on the notion that, in an open economy with a flexible exchange rate that depends on domestic borrowings to finance its debts, an increase in its budget deficit results in increased domestic interest rates (which consequently encourages foreign investors to invest in the home country). This results in higher capital inflows and an appreciation of the exchange rate that result from increased demand for financial assets in the country, which consequently increases demand for the home currency (Sakyi and Opoku 2016). As a result, exports decrease and imports increase, which creates the current account deficit. Hence, an increased budget deficit results in an increase in the current account deficit, which has been later referred to as the 'twin deficit hypothesis'. On the other hand, the Ricardian equivalence hypothesis refutes the twin deficit hypothesis based on the argument that expansionary fiscal policy does not affect consumption and output. Budget deficit arises from tax cuts that reduce public revenues where the public expenditures are assumed to be constant. Rational households tend to save the additional income they receive as a precautionary action towards the expectations of future government contractionary policies (such as raising taxes). Thus, an expansionary policy will result in high private savings and low government saving equivalently, and at the end there will be no impact on real interest rate, exchange rate or current account balance (Abbas et al. 2011). If the equivalence between the private savings and public savings didn't occur, then either a reduction in domestic investment or an increase in the current account deficit (or both) might occur (Helmy and Zaki 2017).

The literature employed different methods to analyze and investigate the TDH. A recent study by Kim and Roubini (2008) based on VAR models examined the effect of budget deficit shocks on the current account and the real exchange rate with a flexible exchange rate system in the US from 1973 to 2004 (post Bretton–Woods). They concluded that the presence of a twin divergence at an expansionary fiscal policy shock improved the current account and depreciated the real exchange rate. Rault and Afonso (2009) used bootstrap panel cointegration techniques and SUR methods to test for two balances (the BB and the CAB) for different EU and OECD countries from 1970 to 2007. Their findings affirmed a positive effect of budget balance on the current account balance for several

EU countries like Austria, Belgium, Czech Republic, Ireland, Latvia and Malta (which supports the TDH). On the contrary, Finland, Italy, Spain and UK were found to have a negative relationship between the BB and the CAB, thus rejecting the TDH. Furthermore, Vamvoukas (1999) tested the TDH from 1948 to 1994 in Greece and found short-run and long-run positive and significant causal link between budget deficit and current account deficit through co-integration and error correction modeling (ECM), thus affirming the Keynesian proposition. Conversely, later studies on Greece tested by Kalou and Paleologou (2012) from 1960 to 2007 and Nikiforos et al. (2015) from 1980 to 2010 applied a granger causality test and found the causality running from current account deficit to budget deficit, which proves the current account target hypothesis (thus refusing the TDH).

A number of papers examined the TDH resource-rich countries' single country models. and the results were mixed. For example, Alkswani (2000) examined the TDH in Saudi Arabia using Granger causality tests and found that there was a bidirectional causality, thus negating the presence of a TDH. Merza et al. (2012) found a negative long-run relationship between fiscal and external balances in Kuwait using VAR analysis; that is, an increase in the current account surplus will cause a budget deficit (which is opposite of the TDH). Marinheiro (2008) tested the relationship between the two deficits in Egypt and found that there is a positive relationship between the two balances. TDH was rejected due to reverse Granger causality running from current account deficit to budget deficit. Helmy (2018) used the same methodology for Egypt and found that there is a short-run reverse causation between current account deficit and budget deficit in favor of the current account targeting hypothesis. In other words, trade balance improves fiscal balance in the Egyptian economy. Bagheri et al. (2012) analyzed the Iranian economy (Iran being an oil-dependent economy). Using Johansen co-integration and Granger causality covering the period of 1971–2007, the paper found that a TDH holds as a result of fiscal policy ineffectiveness during business cycles. Neaime (2015) examined the same hypothesis in Lebanon from 1970 to 2013 and concluded that budget deficit has a significant impact on current deficit in the short run and referred to the significant impact of the fixed exchange rate regime in amplifying this relation together with the high interest rates and the low national savings, which, altogether, affected the current account. This is in addition to other structural factors such as inefficient government spending and revenue policies as well as corruption.

A limited number of studies attempted to assess the twin deficit hypothesis in resource-rich countries through panel analysis. Eldemerdash et al. (2014) tested the relationship between the current account and the fiscal balance of Arab small open developing countries with fixed exchange rate systems using ordinary least square fixed effects (OLSFE) and Granger causality tests. The findings supported the Keynesian view of a positive relationship between fiscal and external balances for oil-based countries. Similarly, Akanbi and Sbia (2018) investigated the TDH with respect to a panel of 31 oil exporting countries in the period between 1984 and 2013 through a two-stage least squares models. They concluded that TDH is not found in oil exporting countries, as the oil sector is blurring its existence.

3. Geopolitics, Oil-Price Shocks and Twin Deficits in MENA Region: An Empirical Investigation

In this paper, we contribute to the above literature on TDH through examining the twin deficit hypothesis in 10 MENA countries classified as being oil or non-oil economies. The classification of the examined MENA region economies as being oil or non-oil is done with the aim of examining the impact oil dependency as a source of domestic revenues and for foreign currency in making those economies' fiscal and external accounts more vulnerable to regional geopolitical shocks that transmit through oil price dynamics. We propose two research questions:

- Does a twin deficit hypothesis hold in MENA region countries?
- To what extent is the TDH related to geopolitical factors and oil-price related shocks?

The oil-rich countries included in our analysis are the UAE, Saudi Arabia, Kuwait, Iran and Libya, as they are the top oil exporting countries in the MENA and the world.

The non-oil countries are Egypt, Tunisia, Jordan, Morocco and Yemen. The period from 1990–2018 was chosen as it was the year of economic reforms and structural adjustments being implemented in most MENA countries. In the remainder of this section, we present some descriptive and statistical analysis as a preliminary illustration of the TDH in the MENA region and its possible relevance to geopolitical and oil-related shocks, both in oil and non-oil countries. This will be followed by an empirical examination of the same hypothesis using PVAR analysis, as will be explained thoroughly in the next section.

3.1. Descriptive Analysis

Primarily, an initial illustration of the budget balance and current account trends in oil-rich MENA countries (Figure 1) from 1990 to 2018 might demonstrate the presence of TDH in the examined countries. This is revealed by consistent periods of deficits and surpluses in both accounts. An intuitive interpretation of this result is that fiscal and monetary balances in such countries (being oil dependent) are most vulnerable to global and regional oil price shocks. A positive oil price shock results in surpluses in both balances and vice versa. Table 1 summarizes specific periods of significant oil prices shocks and the relevant impact on both budget balance and current account balance in the examined countries.
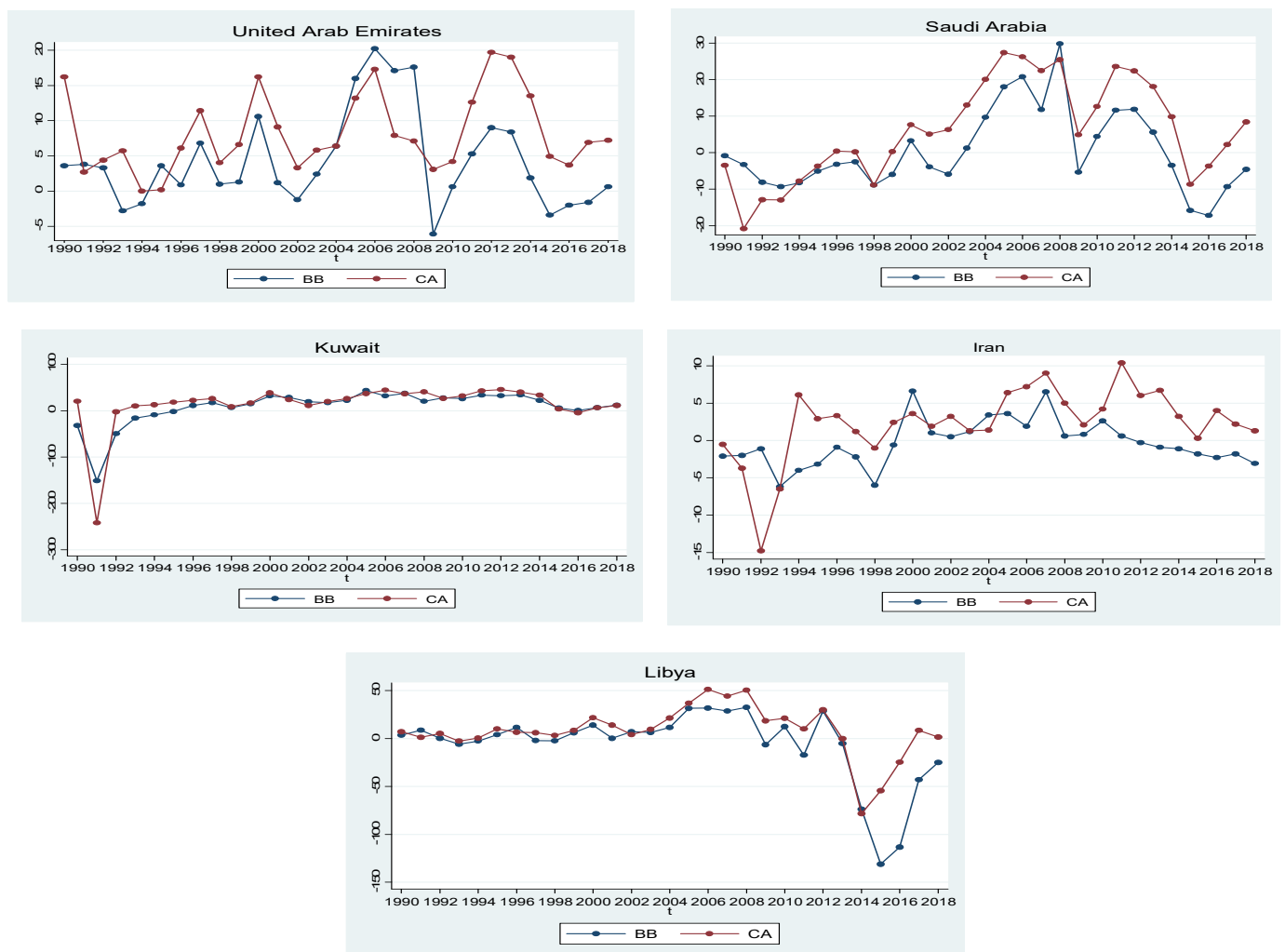
Figure 1. Budget deficit and current account deficit in oil-rich MENA countries (1990–2018). Source: IMF World Economic Outlook.

Table 1. Illustration of the relevance of main oil price shocks and events to the budget balance and current account balance in oil-rich MENA countries.

Country	Period	Oil Price Trends	Impact on Budget Balance and Current Account
Saudi Arabia	1990 to 2002	Low oils $20 per barrel. Asian financial crisis resulted in lower demand on oil globally.	Budget deficit of −0.9% to −5.9%. Current account deficit ranging between −3.7% and −8.9% and it reached −20.8% in 1995.
	2003–2013	Increase in oil prices from $31 per barrel to $98 per barrel. Iraq's war in 2003 which led to a decrease in oil production (Eid 2015).	Continuous budget surplus (1.2–5.6 percent of GDP) with a peak in 2008 of 29.8 percent of GDP in 2003. A surplus in current account balance (7.6–9.8 percent of GDP) with a peak of 27.4 percent in 2004. (IMF 2013b).
Kuwait	2005–2012		Budget balance reached 43.3 percent of the GDP in 2005. The current account balance reached 45.5 percent of GDP in the same year. The economy is relatively less oil-dependent and it has other diversified sources of revenues (such as VAT).
	1990–1993	War with Iraq resulted in the lowest level of oil production and revenues	In 1991, both balances witnessed a huge deficit of −151.3% of GDP in the budget balance and −242.2% of GDP in the current account balance (IMF 2005).
Iran	1990–1998	War with Iraq resulted in a decrease in oil revenues that accounted for more than 70% of Iranian exports and more than 50% of government revenues (IMF 2000).	Budget deficit ranging from −2.1 to 6.1 percent of GDP. Current account deficit ranging from −0.5 to 6.5 percent of GDP, including a sharp deficit of −14.8 percent in 1992.
	1999/2000	Positive oil price shock.	Surplus in both balances. Current account balance is 2.4 percent of GDP and budget surplus reached 6.6 percent of GDP in the same period
Libya	1999–2010	Rising oil prices and increased oil revenues.	Budget surpluses during this period and it reached 32.5 percent of GDP in 2008. Current account surpluses during this period and it reached 51.1 percent of GDP in 2006.
	2014–2016	Decrease in oil revenues	Budget deficit reaching −113.3 percent of GDP in 2016. Current account deficit was −78.4% in 2014 (World Bank 2017).

If one argues that oil dependency is a core factor causing the TDH in MENA oil region countries, then it would be expected that other non-oil dependent MENA economies would show a less prevalent twin deficit hypothesis. Nevertheless, the initial demonstration of budget balances and current account balances in those countries show different results. Twin deficits might occur in those countries due to structural fiscal imbalances as well as the high dependence on vulnerable sources of foreign currencies to finance external accounts. Such economies suffer from accumulated deficits during most of the studied period due to their dependence on other sources such as tourism, foreign aid, remittances and the adoption of pro-cyclical policies during recessions (Figure 2). Structural fiscal deficits persist due to the increased spending on subsidies and debt service. Deficits in current accounts result from poor export-driven growth, vulnerability of tourism and remittances revenues, as well as the high dependence on imported goods.

Figure 2. Budget deficit and current account deficit in non-oil MENA countries (1990–2018). Source: IMF World Economic Outlook.

Egypt, like all non-oil countries, is an economy that has these issues. In 1998, both balances were in deficit, having a −5.1% in the budget balance and −2.8% in the current account balance. The current account balance was affected this year as appreciation of the real exchange affected the competiveness of the exports and beside that the Luxor massacre in 1997 decreased tourism. In addition to the downturn in oil prices in the gulf area, exports and remittances also saw a downturn. This has also reflected on budget balance due to decreased revenue (Panizza 2001). Similarly, high dependence on remittances of Jordan and Yemen made them highly vulnerable to regional geopolitical shocks such as the Gulf wars and fluctuating oil prices. For example, the 1990 Gulf war worsened the situation,

which lead to decreased foreign grants and the return home of Jordanian workers, which widened the deficit in both balances (Ramachandran 2004). Additionally, Yemen's support for Iraq from 1990 to 1991 during the Gulf war created deficits in both balances, where the war increased the government spending. The current account balance was also affected in 1993 as a result of the expulsion of one million Yemeni workers working in Saudi Arabia, impacting the remittances severely. This is in addition the cut in the economic aid from Saudi Arabia and Kuwait (Library of Congress–Federal Research Division 2008).

Following the Global Financial Crisis and the Arab Spring, non-oil economies witnessed a severe deterioration in both balances as depicted in Figure 3. The pro-cyclical fiscal policy adopted in those countries magnified the fiscal and external balance problems (Helmy and Zaki 2017). Politically-driven fiscal interventions worsened the fiscal performance massively. The huge increase in government spending to calm down the uprising resulted in an increase in the wage bill, food and energy subsidies and social measures such as programs for youth unemployment in Egypt and Tunisia. Similarly, current balances in those countries was affected severely due to the turbulence in the economy and insecurity, resulting in lower tourism receipts (IMF 2012). Morocco was also affected in both balances during the same period as a result of the mentioned exogenous shocks that affected the fiscal and external balances of the Moroccan economy negatively. However, what made the economy overcome such a high deficit was the higher grants, non-tax revenue, the reduction in the subsidy bill by almost 2% of the GDP and the reduction of spending on wages by nearly a half percent of GDP, which resulted in improving the fiscal and external balances shortly after the shock. The less dependence on energy imports and the increased substitution of industrial goods that are imported by domestic production (IMF 2013a) contributed to quickly improving the external balance in addition to the sustained remittances position.
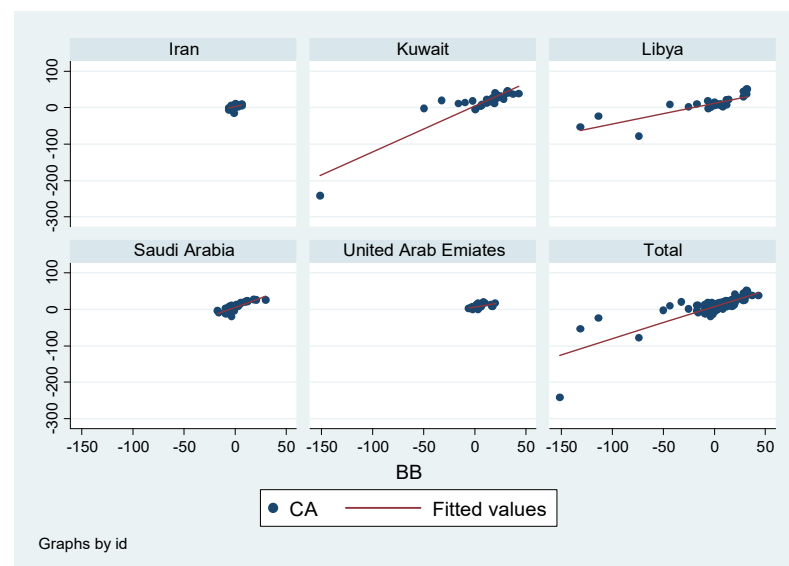
Figure 3. Correlation of budget balance with current account balance in oil-rich countries.

3.2. Modelling the TDH in MENA Countries: PVAR

We test the above hypothesis through Panel VAR (PVAR) tests through generalized impulse response functions (GIRF), cointegration and Granger causality tests to examine interactions between the current account balance, budget balance, real GDP growth and the other macro-fiscal variables as presented in Equation (1). Data descriptions are presented in Table 2.

$$CAB_{it} = \beta_0 + \beta_1 BB_{it} + \beta_2 REER_{it} + \beta_3 RGDP_{it} + \beta_4 INV + \beta_5 TO + U_{it} \tag{1}$$

Table 2. Data description and relevance to literature.

Variables	Description	Source	Relevance to Literature
CAB	Current account balance (surplus/deficit) as a % of GDP (in log)	IMF World Economic Outlook	The budget balance and current account balance are the main variables to be tested in the TDH. Rault and Afonso (2009) and Forte and Magazzino (2013) for EU countries, Eldemerdash et al. (2014) for oil and non-oil countries and Aloryito et al. (2016) for Sub-Saharan Africa.
BB	Net lending(+)/borrowing (-) (overall balance) as a % of GDP (in log)	IMF World Economic Outlook and World Bank	
REER	Real Effective Exchange rate (CPI based) (in log)	Bruegel working paper Darvas (2012)	Used in Aristovnik and Djurić (2010) and Forte and Magazzino (2013) for EU countries to show how this variable plays a pivotal role through how the budget balance affects the current account balance, which is similar to the Mundel–Flemming framework.
RGDP	Real GDP Growth as % of GDP (in log)	IMF World Economic Outlook	Real GDP growth is used because of the two balances having different responses to economic cycles that needs to be taken into consideration through this variable, which is shown in Eldemerdash et al. (2014) for oil and non-oil countries, Aloryito et al. (2016) for Sub-Saharan Africa and Akanbi and Sbia (2018) for oil exporting countries.
INV	Total investment as % of GDP (in log)	IMF World Economic Outlook	The total investment is mentioned in the national account identity explained earlier, which indicates that when there are investments, the current account balance worsens (which is used as a variable in Marinheiro (2008) and Helmy and Zaki (2017) for Egypt, Aristovnik and Djurić (2010) for EU countries, Anantha Ramu and Gayithri (2017) for india and Eldemerdash et al. (2014) for oil and non-oil countries).
TO	Trade openness as % of GDP (in log)	World bank and United Nations Statistics (UNCTAD stat)	Included to account for an economy's integration level, which will help in identifying the current account balance situation such as in Eldemerdash et al. (2014) for oil and non-oil countries and Akanbi and Sbia (2018) for oil exporting countries.

3.2.1. Correlation between Budget Balances and Current Account Balances in the MENA Region

Figures 3 and 4 present the correlation results between the budget balances and the current account balance in the examined countries. Figure 4 shows a strong positive correlation between the two balances. This is affirmed for independent countries and for all oil countries together. Oppositely, Figure 5 shows different results. A strong positive correlation only in Yemen while the correlation appears to be weaker in other countries.
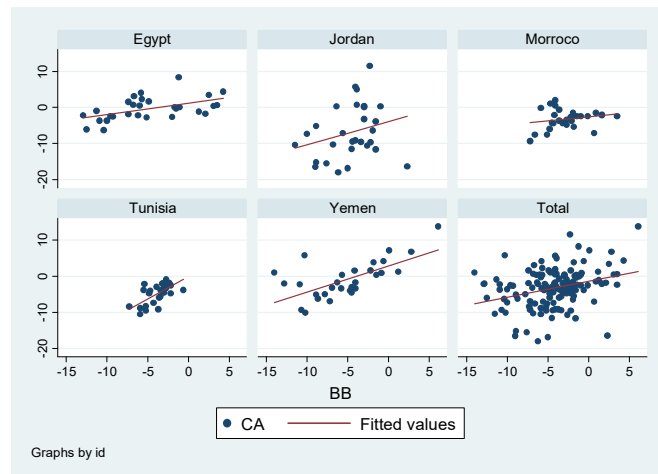
Figure 4. Correlation of budget balance with current account balance in non-oil countries.
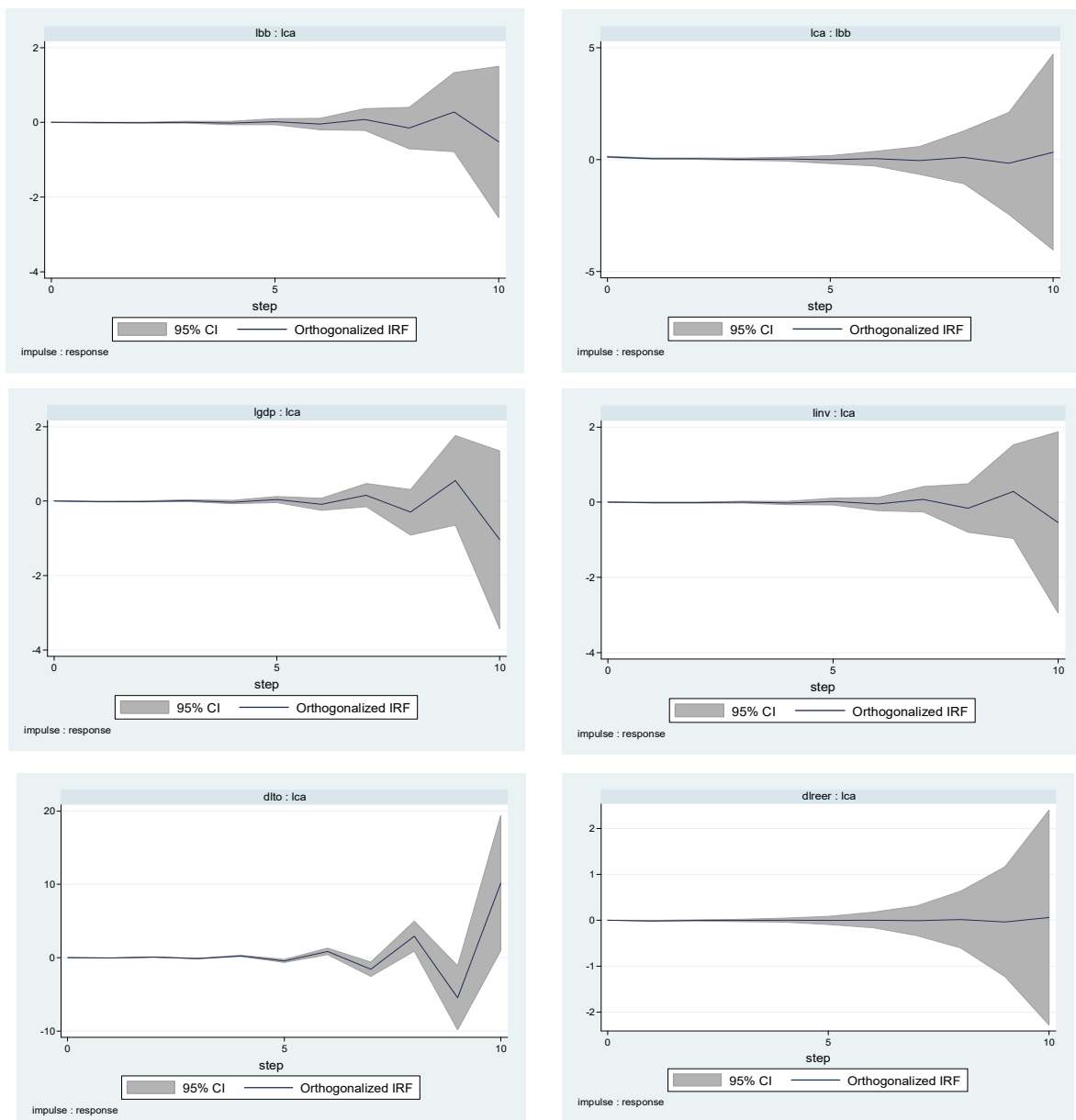
Figure 5. Impulse response functions (IRF) for oil-rich countries.

3.2.2. Panel Unit Root Tests and Cointegration Analysis

The stationarity of the variables is tested using Levin et al. (2002) (LLC) and Im et al. (2003) (IPS) panel unit root tests. Table 3 shows the results, which suggest the rejection of the unit root (null hypothesis) and stationarity for all variables at the same level except for real effective exchange rate (REER) and trade openness (TO). However, all variables were found to be stationary at their first differences in the IPS test and not the LLC test, where trade openness in oil countries and REER were found to contain unit roots in their first difference. Therefore, it is preferable to follow the IPS test, since it overcomes the limitations of the LLC test[1]. In particular, the current account balance, REER, TO and INV were not stationary at level, but they were stationary in first difference. Hence, a co-integration analysis is possible for the selected indicators.

Table 3. Panel unit root tests.

Ho: Panels Contain Unit Roots Ha: Panels Are Stationary	Level		First Difference	
	p-Value		*p*-Value	
Panel: full sample	LLC	IPS	LLC	IPS
Current account balance	0.0000	0.0011	0.0000	0.0000
Budget balance	0.0000	0.0001	0.0000	0.0000
Real effective exchange rate	0.0780	0.3281	0.0001	0.0000
Real GDP growth	0.0000	0.0000	0.0000	0.0000
Total investment	0.0042	0.0090	0.0042	0.0000
Trade openness	0.6288	0.4747	0.0000	0.0000
Panel: oil countries	LLC	IPS	LLC	IPS
Current account balance	0.0000	0.0006	0.0000	0.0000
Budget balance	0.0000	0.0007	0.0000	0.0000
Real effective exchange rate	0.1254	0.6960	0.0000	0.0000
Real GDP growth	0.0000	0.0000	0.0000	0.0000
Total investment	0.0003	0.0033	0.0000	0.0000
Trade openness	0.7619	0.3735	0.9730	0.0001
Panel: non-oil countries	LLC	IPS	LLC	IPS
Current account balance	0.2625	0.0550	0.0000	0.0000
Budget balance	0.0131	0.0092	0.0000	0.0000
Real effective exchange rate	0.2030	0.1266	0.3866	0.0000
Real GDP growth	0.0009	0.0000	0.0000	0.0000
Total investment	0.2170	0.2644	0.0000	0.0000
Trade openness	0.4307	0.5920	0.0154	0.0000

Note: the rejection of the null hypothesis (Ho) of a unit root at 10%, 5% and 1% levels of significance. Source: author's estimates.

Table 4 presents the results of the co-integration analysis implemented using the error–correction based panel cointegration test by Westerlund (2007). It tests for the co-integration relationship existence between two main variables: the budget balance and the current account balance in the full sample, oil and non-oil countries. The null hypothesis—(H0) of no co-integration—is rejected for the full sample according to the group mean and panel tests statistics presented in Table 4. This affirms a long-run steady-state relationship between the budget balance and current account balance, indicating a validity of TDH in the examined countries.

Table 4. Co-integration analysis.

Ho: No Cointegration	Panel: Full Sample	Panel: Oil Countries	Panel: Non-Oil Countries
	p-Value	*p*-Value	*p*-Value
Current account-Budget balance			
Westerlund (2007)			
Group Gt statistic (standard)	0.000	0.000	0.000
Group Ga statistic (robust)	0.005	0.003	0.000
Panel Pt statistic (standard)	0.000	0.000	0.000
Panel Pa statistic (robust)	0.000	0.000	0.000

Note: Gt and Ga are group mean statistics that test the null hypothesis (Ho) of no co-integration at 5% and 1% levels of significance for the whole panel against the alternative (Ha) of co-integration for some countries in the panel. Pt and Pa are the panel statistics that the null hypothesis (Ho) of no co-integration at 5% and 1% levels of significance against the alternative of co-integration for the panel as a whole. Source: author's findings.

3.2.3. PVAR and Granger Causality Analysis

Following the Panel Vector Autoregression (PVAR) approach by Abrigo and Love (2015), we test the dynamic effect of a budget balance shock and other variables on the current account balance. First, we selected the optimal lag order based on three main criteria: the Akaike information criteria (AIC), the Bayesian information criteria (BIC) and the Hannan–Quinn information criteria (HQIC) (Tables 5 and 6). PVAR model is conducted using GMM estimation of first order with same specification of instruments.

Table 5. Lag order selection criteria for oil-rich countries.

Lag	CD	J	J *p*-Value	BIC	AIC	QIC
1	0.9976262	89.75731	0.0766997	−254.9421	−54.24269	−135.7476
2	−0.0434123	43.06074	0.1947116	−129.289	−28.93926	−69.69174

Sample: 1994–2017 No. of obs = 120
No. of panels = 5
Ave. no. of T = 24.000

Table 6. Lag order selection criteria for non-oil countries.

Lag	CD	J	J *p*-Value	BIC	AIC	QIC
1	0.5777068	84.97333	0.1407282	−259.7261	−59.02667	−140.5316
2	0.593515	46.52938	0.1123666	−125.8203	−25.47062	−66.22309

Sample: 1994–2017 No. of obs = 120
No. of panels = 5
Ave. no. of T = 24.000

Second, after confirming the cointegration and lag selection of first order. We estimate the coefficients of this long-run relationship through GMM PVAR estimation. A positive significant relation between the two balances is found in oil-rich countries (Table 7). An increase in the budget balance by 1% results in an increase in the current account balance by 0.017%. Hence, the Keynesian proposition of the existence of a TDH is evident in oil-rich countries, where a budget surplus results in a current account surplus. The results support Eldemerdash et al. (2014), Morsy (2009) and Akanbi and Sbia (2018) for resource-rich economies and oil exporting countries. The reverse causality hypothesis—from current account balance to budget balance—is rejected as per the results presented in Table 8. This also reaffirms the unidirectional relation and supports the TDH hypothesis in oil-rich economies.

Table 7. GMM PVAR estimations—Oil countries.

Variables	Current Account	Budget Balance	ΔREER	GDP Growth	Total Investment	ΔTrade Openness
Lagged Current account	−0.0129291 (0.072)	−0.764252 (0.000)	0.1850592 (0.000)	0.9253072 (0.000)	0.3757229 (0.000)	−1.370283 (0.000)
Lagged Budget balance	0.0172951 (0.008)	0.8580624 (0.000)	−0.1587018 (0.000)	−1.134299 (0.000)	−0.2639757 (0.000)	1.411876 (0.000)
Lagged REERΔ	−0.0762447 (0.000)	−0.0835283 (0.000)	0.1517432 (0.000)	−0.130429 (0.000)	0.2774289 (0.000)	−0.271178 (0.000)
Lagged GDP growth	−0.0244887 (0.000)	−0.0116363 (0.011)	−0.0094626 (0.000)	−0.1450394 (0.000)	0.0143457 (0.000)	0.0443089 (0.000)
Lagged Total investment	−0.0529807 (0.000)	−0.0601517 (0.000)	0.0346498 (0.058)	−0.6200547 (0.000)	0.8403708 (0.000)	0.0558369 (0.205)
Lagged trade opennessΔ	−0.1869155 (0.000)	−0.4601908 (0.000)	0.3980776 (0.000)	−0.0510231 (0.595)	1.264939 (0.000)	−2.025962 (0.000)
Observations	130	130	130	130	130	130

Note: *p*-values in parentheses () and they indicate a significance levels at 5% and 1%. Δ Denotes that the variable is in first difference. Source: author's findings.

Table 8. Panel granger causality test—Oil countries.

Equation/Excluded	Chi2	df	*p* > Chi2
Current account			
Budget balance	7.035	1	0.008
REERΔ	47.094	1	0.000
GDP growth	707.110	1	0.000
Total investment	37.681	1	0.000
Trade opennessΔ	141.104	1	0.000
ALL	1326.821	5	0.000
Budget balance			
Current account	2095.158	1	0.000
REERΔ	82.910	1	0.000
GDP growth	6.387	1	0.011
Total investment	32.015	1	0.000
Trade opennessΔ	397.228	1	0.000
ALL	3620.204	5	0.000

Ho: Excluded variable does not Granger-cause Equation variable
Ha: Excluded variable Granger-causes Equation variable

Note: *p*-values reject the null hypothesis (Ho) indicate significance levels at 5% and 1% levels. Δ Denotes that the variable is in first difference. Source: author's findings.

On the contrary, results were different for non-oil countries. As shown in Table 9, a significant negative relation between the two balances was found. An increase in the budget surplus by 1% worsens the current account balance by 0.12%. This rejects the hypothesis of the existence of a TDH in those countries and rather supports the presence of Ricardian equivalence. This supports Akanbi and Sbia (2018) for a close group of MENA countries. While a bi-directional causality is proven (Table 10), the direction of causality doesn't matter as long as the relation is proven negative: A TDH is still rejected for non-oil countries.

Table 9. GMM PVAR estimations—non-oil countries.

Variables	Current AccountΔ	Budget Balance	REERΔ	GDP Growth	Total InvestmentΔ	Trade OpennessΔ
Lagged Current accountΔ	−0.4492705 (0.000)	−0.0759679 (0.000)	−0.0112542 (0.000)	−0.0694275 (0.000)	−0.0315228 (0.000)	−0.0055893 (0.028)
Lagged Budget balance	−0.1222366 (0.000)	0.6719996 (0.000)	0.0459064 (0.000)	0.0966541 (0.000)	−0.1038255 (0.000)	−0.0235697 (0.002)
Lagged REERΔ	0.136836 (0.003)	0.1475119 (0.198)	0.1966597 (0.000)	0.4415138 (0.000)	−0.4400424 (0.000)	−0.0595654 (0.009)
Lagged GDP growth	0.3784264 (0.000)	0.3527599 (0.000)	0.0264484 (0.083)	0.6512119 (0.000)	0.1763951 (0.000)	−0.0706059 (0.000)
Lagged Total investmentΔ	−1.301331 (0.000)	−1.248774 (0.000)	−0.342208 (0.000)	−0.376846 (0.022)	−0.1710501 (0.014)	−0.1046704 (0.000)
Lagged trade opennessΔ	0.6392724 (0.000)	0.7071824 (0.000)	0.8909835 (0.000)	−0.2462973 (0.040)	0.1311803 (0.034)	0.4609399 (0.000)
Observations	130	130	130	130	130	130

Note: *p*-values in parentheses () indicate a significance level at 5% and 1%. Δ Denotes that the variable is in first difference. Source: author's findings.

Table 10. Panel granger causality test- non-oil countries.

Equation/Excluded	Chi2	df	*p* > Chi2
Current accountΔ			
Budget balance	28.717	1	0.000
REERΔ	8.616	1	0.003
GDP growth	66.233	1	0.000
Total investmentΔ	75.287	1	0.000
Trade opennessΔ	33.699	1	0.000
ALL	188.665	5	0.000
Budget balance			
Current accountΔ	58.472	1	0.000
REERΔ	1.659	1	0.198
GDP growth	30.237	1	0.000
Total investmentΔ	97.756	1	0.000
Trade opennessΔ	24.088	1	0.000
ALL	143.399	5	0.000

Ho: Excluded variable does not Granger-cause Equation variable
Ha: Excluded variable Granger-causes Equation variable
Δ: Change in REER

Note: *p*-values reject the null hypothesis (Ho) and indicate significance levels at 5% and 1% levels. Source: author's findings.

Real effective exchange rate (REER) is an important channel between the budget balance and the current account balance[2]. Results show a negative relation between REER and the current account balance in oil-rich countries; that is, an appreciation in REER results in a current account deficit. This can be interpreted in light of the Mundell–Fleming framework where a real appreciation of a currency results in a loss of price competitiveness and a discouraged external demand (which reduces net exports). Thus, the current balance position is worsened. Conversely, a positive relation was found in non-oil countries; an appreciation in REER results in an improvement in the current account balance and vice versa. This can be interpreted in light of the lower trade elasticity in those counties, particularly given the fact that they are witnessing deficits most of the times and that exports and imports are less elastic to changes in exchange rates. Additionally, the fact that some of these countries adopt fixed exchange rates might also give an explanation to this low elasticity to changes in REER.

Opposite findings between oil and non-oil countries are also evident in other variables included in the model: namely trade openness and GDP. Trade openness was found to negatively impact current balance in oil-rich countries which is consistent with Eldemerdash et al. (2014) findings. Oil trade dependency is generally non-positively related to trade openness, since importing goods might harm the current account surplus produced from exporting oil. Oppositely, trade openness is significantly positively related to the improvement of current balances and the reduction of deficits in non-oil countries. Intuitively, more trade openness in countries with current account deficits—due to high dependence on imports—results in improvements in export positions, which improves the current account balance. Real GDP relation to current account balance is found to be negative in oil-rich countries and positive in non-oil countries.

3.2.4. Impulse Response Functions (IRF) Analysis

The purpose of the analysis of impulse response function (IRF) is to identify the performance of each variable and their dynamic relationship in the short-run and the long-run in response to shocks in other variables. The short-run is specified to be from period 0 to 5 while the long-run is specified to be from period 5 to 10. Figures 5 and 6 present the IRFs for oil-rich and non-oil countries, respectively. IRFs show no clear short-run response of the current account balance to a fiscal shock. In the long run, a positive fiscal shock has a positive impact on current account balance which, again, re-affirms the existence of a TDH in oil-rich countries. Oppositely, positive fiscal shocks have a negative effect on the current account balance in non-oil countries in the short-run that turns into a positive effect over the long run; that is to say, TDH is rejected in non-oil counties in the short run only.
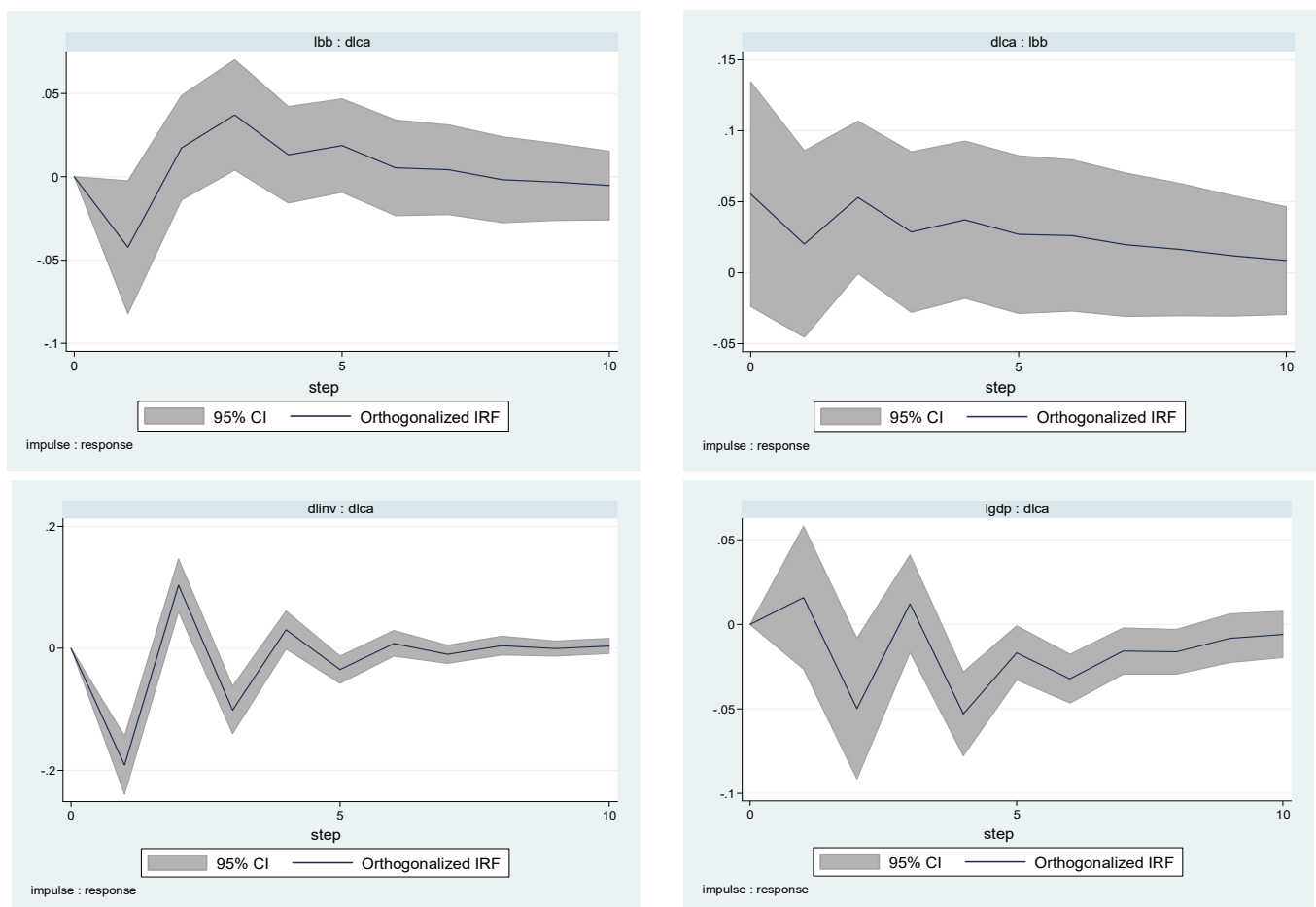
Figure 6. *Cont.*
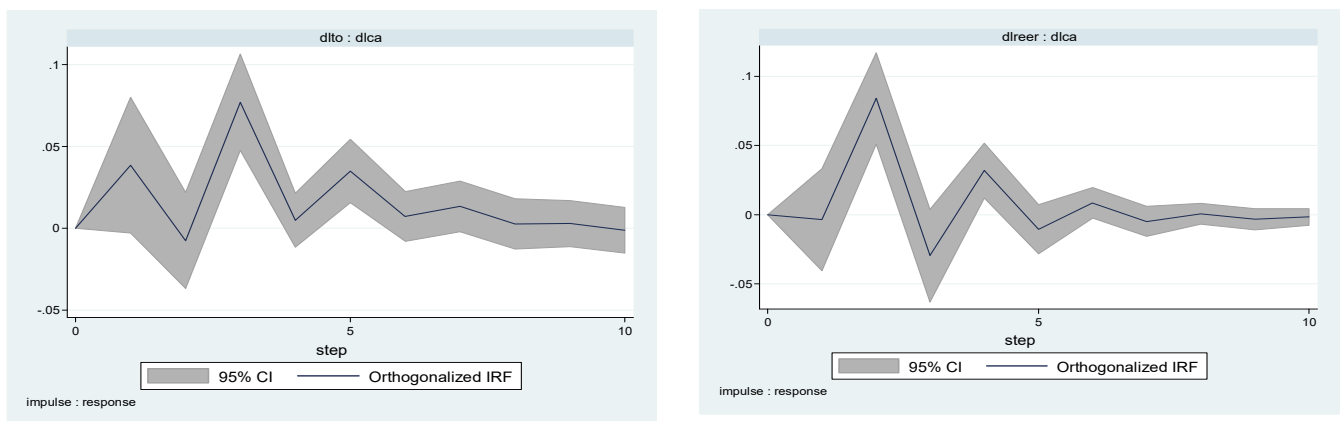
Figure 6. Impulse response function (IRF) for non-oil countries.

4. Conclusions and Policy Recommendations

The paper examines the relationship between the fiscal and external balances in the MENA region in an attempt to answer the question of whether geopolitics and oil-price dynamics contribute to the changing the relation between the fiscal variables and the current account variables in the context of the twin deficits hypothesis (TDH). Descriptive analysis, as well as PVAR GMM estimation, indicate the existence of TDH in oil-rich countries only. Oppositely, no sufficient empirical evidence on its existence in non-oil countries was found. Rather, our findings support a Ricardian equivalence hypothesis in those countries. We argue that oil dependence poses a strong influence on fiscal performance in MENA oil-rich countries and, consequently, on exports and trade balance. This makes those countries more fiscally and externally vulnerable to geopolitical tensions and oil price dynamics. The argument that adopting fixed exchange rate regimes in oil-rich countries magnifies such vulnerabilities is also supported by our empirical results.

Oppositely, for non-oil countries, fiscal and external balances problems mainly occurred as a result of structural problems. In in the examined non-oil countries, we have observed the high reliance on tourism revenue remittances as the main sources of foreign currency receipts. In addition, many of the examined countries suffer from poor tax revenues and enlarged current spending bills (inflated public sector, large subsidies system, high interest payments, etc.), altogether limiting fiscal space and increasing vulnerabilities to both domestic and external shocks. It is also worth noting that most of the reviewed countries have a large imports sector, which makes the countries' external accounts also weak and more vulnerable.

A number of policy implications can be drawn from the above research exercise:

- Primarily, reforming fiscal performance in oil-rich countries is not of less importance than non-oil ones. Oil-rich countries need to reform their fiscal performance in the sense that they need to decrease the reliance on oil revenues and develop the non-oil sector. Those countries are also urged to revise their currency regimes towards more flexible regimes in order to decrease the vulnerability to external shocks.
- Secondly, regarding non-oil countries, fiscal or current account targeting might not be the proper solution under the Ricardian equivalence hypothesis, since most of the examined countries suffer from persistent structural deficits. Those countries need to adopt fiscal consolidation programs that aim at reforming their spending structures on one side as well as improving sources of revenues; particularly tax administration on the other side.
- Thirdly, Non-oil countries need to also adopt rather flexible exchange rate regimes in order to decrease the vulnerability of the external sector to domestic, regional and global shocks.
- Finally, export-led growth strategies and inclusive growth policies would also contribute to improving external accounts in the examined economies.

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Notes

[1]   More on the IPU tests as opposed to the LLC tests can be found in Gengenbach et al. (2009).

[2]   An increase in REER is a real appreciation and a decreasing index of REER is a real depreciation of the currency.

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