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Nonlinear Fiscal Multipliers in Saudi Arabia

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Abstract: This paper presents an estimation of the fiscal multipliers for Saudi Arabia, conducted by applying the local projection (LP) method. It also presents an exploration of the non-linear features of fiscal multipliers. The findings showed that (i) consistent with earlier studies, fiscal multipliers are generally moderate; (ii) the investment spending multiplier is larger in magnitude than the current spending multiplier; (iii) the non-oil revenue multiplier is negative; (iv) the output response to fiscal shocks is larger during expansions; and (v) fiscal multipliers are stronger during a contractionary fiscal policy phase.

Keywords: government spending; non-oil revenue; non-linear fiscal multipliers; local projection method; Saudi Arabia

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1. Introduction

Since 2014, oil price plugging has generated strong macroeconomic shocks for many oil-exporting countries. In Saudi Arabia, lower oil prices have substantially weakened the fiscal position and triggered large fiscal adjustments aimed at offsetting the likely permanent revenue losses. Given that, the country has embarked on an economic reform program that includes spending cutbacks as well as tax hikes. The need for fiscal consolidation and to preserve the momentum of growth has refocussed attention on the topic of fiscal policy effectiveness. Thus, the question as to whether fiscal policy can influence economic growth is relevant since government spending has historically been the main determinant in the non-oil sector.

There is limited consensus in the literature on both the estimation method and the size of fiscal multipliers. Ramey (2019) provides a review of the recent empirical literature on fiscal multipliers. The evidence from developed countries suggests that spending multipliers are positive but less than or equal to unity. However, this range widens when country characteristics, such as the stage of development, the exchange rate regime, the trade openness and the type of government spending, are considered. Moreover, evidences suggest that fiscal multipliers tend to vary over time and across countries. Particularly, fiscal policy effects revealed to be sensitive to the business cycle as well as the direction of the fiscal intervention. One strand of this literature proved the linkages between fiscal policy and the state of the economy. It differentiates the size of fiscal multipliers when the economy is either in recession or in expansion. The prevailing view is that fiscal multipliers are larger in recessions than expansions (Auerbach and Gorodnichenko 2010, 2011; Baum and Koester 2011). Another strand of the literature considers that the direction of the fiscal intervention—expansionary vs. contractionary fiscal policy is matter in determining the effect of fiscal policy (Barnichon et al. 2022).

Most of the empirical studies about fiscal multipliers are interested in advanced economies, and very few studies address this issue in emerging market economies and developing countries. As discussed by Batini et al. (2014), the empirical papers focused on emerging and developing economies have yielded multipliers that are indeed smaller

than those found in advanced countries. This difference is explained by the particularities of emerging and developing countries, which ask for a specific analysis of multiplier mechanisms (Combes and Mustea 2014), and make the fiscal policy transmission channel different (Baldacci et al. 2004).

Despite their operational importance for policymakers, few empirical studies that estimate the size of fiscal multipliers in oil exporting countries in general, and Saudi Arabia in particular. The extant empirical studies suggest that fiscal multipliers are lower and capital multipliers are higher than current expenditure ones. They do not take into account the potential non-linear effects of fiscal policy. However, estimating non-linear fiscal multipliers is necessary for several reasons. First, the effects of fiscal shocks are particularly pertinent for Saudi Arabia because fiscal policy has a significant impact on economic activity. Second, as fiscal stimulus is often implemented during bad times, the meaningful multiplier is the one estimated in such times during the business cycle, rather than the "average multiplier". On this basis, the estimation of fiscal multipliers during boom and recession times deserves special consideration. Third, as Saudi Arabia's fiscal policy is primarily procyclical, it is essential to differentiate between positive and negative fiscal interventions.

Given this background, the objective of this study was to provide a reliable estimate of non-linear fiscal multipliers. The contribution of this paper is twofold. First, unlike previous research efforts, it estimated non-linear effects of fiscal policy. We focused on two forms of non-linearities. The first stems from the state of the business cycle—i.e., expansion vs. recession—while the second is related to the direction of fiscal intervention—i.e., expansion vs. contraction. Second, previous studies have focused on the effect of government spending on the output in Saudi Arabia, while no analyses have estimated fiscal multipliers associated with non-oil revenue. To the best of our knowledge, this is the first analysis to have estimated non-linear fiscal multipliers associated with government spending, current spending, investment spending, and non-oil revenue. The quantitative results are based on the local projection (LP) method developed by Jordà (2005).

The paper continues as follows: Section 2 presents a review of the literature, Section 3 provides an overview of fiscal policy, Section 4 outlines the empirical methodology, Section 5 reports the empirical results, Section 6 discusses the empirical results and provides policy recommendations and Section 7 concludes the paper.

2. Literature Review

The question regarding the effectiveness of fiscal policy has regained interest since the onset of the subprime crisis. This owes much to the significant role played by the fiscal policy in stimulating growth and to the emerging challenges associated with fiscal adjustment for macroeconomic stability. For oil-exporting countries, the impact of this crisis was intensified by the sharp decline in oil prices.

Theoretically, there is no consensus regarding the effects of fiscal policy. According to conventional Keynesian models, the fiscal multiplier is predicted to be positive and higher than the unit. In neoclassical models, fiscal policy affects output by influencing the hours worked via two channels: the negative wealth effect and the intertemporal substitution behaviour. Neoclassical models predict positive or negative values for fiscal multipliers depending on the composition of government spending, how it is financed, and the state of the economy. New Keynesian models introduce nominal rigidities and credit constraints and predict much smaller multipliers, equal to or lower than the unit.

Empirically, recent evidence has highlighted the wide range of multiplier estimates. According to Riera-Crichton et al. (2015), the magnitude of multipliers varies substantially, from -4 to 4. One reason for this is the use of different methodologies. The fiscal studies have often relied on two main empirical methods. The first method is associated with DSGE models (Coenen et al. 2012), while the second is based on time series models, specifically the vector autoregression (VAR) model. In the context of the VAR framework, there are different schemes to identify structural fiscal shocks (Blanchard and Perotti 2002; Fatás and Mihov

2001; Mountford and Uhlig 2009; Ramey and Shapiro 1998). However, empirical studies based on the VAR framework remain insufficient to account for non-linear specificities of fiscal multipliers. More recently several studies used the local projection (LP) method (Jordà 2005) as it is easily adapted to estimate the state-dependent fiscal multiplier (Auerbach and Gorodnichenko 2011; Ramey and Zubairy 2018).

Another reason could be that fiscal multipliers are sensitive to countries' particularities such as the level of development (Kraay 2012; Ilzetzki et al. 2013; Batini et al. 2014), the exchange rate regime (Ilzetzki et al. 2013), the degree of openness (Gonzalez-Garcia et al. 2013; Ilzetzki et al. 2013), the level of public debt (Ilzetzki et al. 2013; Huidrom et al. 2020), the monetary policy stance (Christiano et al. 2011), and the state of the economy (Auerbach and Gorodnichenko 2010; Ramey and Zubairy 2018).

While earlier fiscal multiplier studies have referred to linear model specifications, which have been criticized for several aspects, non-linearities have recently gained a lot of attention in the field of the fiscal multiplier. One view from the literature considered that multipliers are sensitive to the business cycle state. Gechert and Rannenberg (2018) have conducted a meta-regression analysis to analyse whether multiplier effects are systematically higher during downturns. They found that spending multipliers are much higher during a downturn. Tax multipliers are not state-dependent. For all spending categories, the multiplier exceeds one during recessions. In line with this, Baum et al. (2012) and Auerbach and Gorodnichenko (2010, 2011) provided evidence demonstrating that fiscal multipliers are higher during recessions than expansions. Another view emphasised the link between the direction of fiscal intervention—expansion vs. contraction—and the size of the multiplier. Barnichon et al. (2022) found that when fiscal policy is contractionary, multipliers can be higher than in expansionary times.

Despite the fact that fiscal multipliers are crucial for policy design, limited attention has hitherto been devoted to oil-exporting countries. In Saudi Arabia, fiscal multipliers are estimated using linear VAR models. Espinoza and Senhadji (2011) estimated a multiplier ranging from 0.2 to 0.5 for government spending, from 0.1 to 0.2 for current spending, and from 0.5 to 1.0 for investment spending. The IMF (2016) found that investment spending varied between 0.2 and 0.8 and current expenditure ranged from 0.3 to 0.5. The IMF (2017) also relied on another approach based on rolling correlations and found a capital expenditure multiplier of 0.6 and a current expenditure multiplier of 0.5 in the long-run. Al Moneef and Hasanov (2020) recently estimated the spending multipliers for Saudi Arabia using VAR models; their results showed spending multipliers ranging from 0.11 to 0.41 for total expenditure, from 0.08 to 0.47 for capital expenditure, and from 0.13 to 0.32 for current expenditure.

3. Fiscal Policy in Saudi Arabia

Saudi Arabia benefits from the substantial revenue generated by the oil sector. As a result, oil revenue has become a main factor in promoting economic growth and development. Between 1970 and 2020, on average, oil revenue accounted for 83% of government revenue, oil exports accounted for 79% of total exports, and oil GDP represented 41% of the total GDP. At the same time, the fiscal policy was exposed to the oil markets, which affected its role by means of many different channels. This means that, during oil market booms, the government receives high oil revenue and then increases its spending and accumulates reserves from any budget surpluses. This mechanism provides the non-oil GDP with newly injected money from external sources, which has higher economic returns. In contrast, when oil markets crash, the budget deficits increase and total expenditure declines. This leads to the reallocation of economic sources among economic agents as the government raises taxes and domestic debt issuances in an attempt to compensate for a reduction in oil revenue. These contractionary policies have undesirable effects on the real non-oil GDP growth (see Figures 1 and 2).

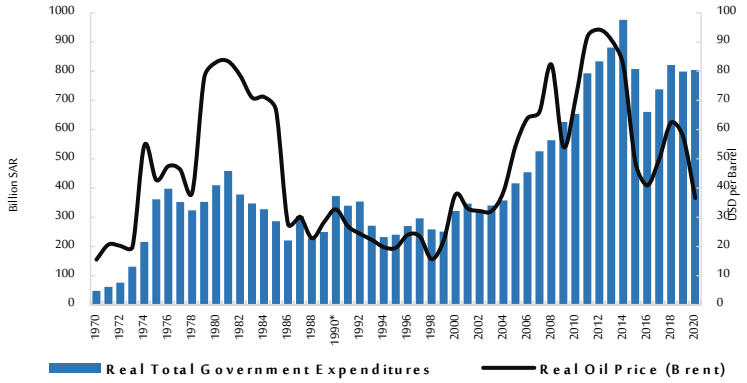

Figure 1. Total Expenditure and Oil Price in Real Terms (1970−2020). Source: Saudi Central Bank, OPEC, and Authors' Estimation.

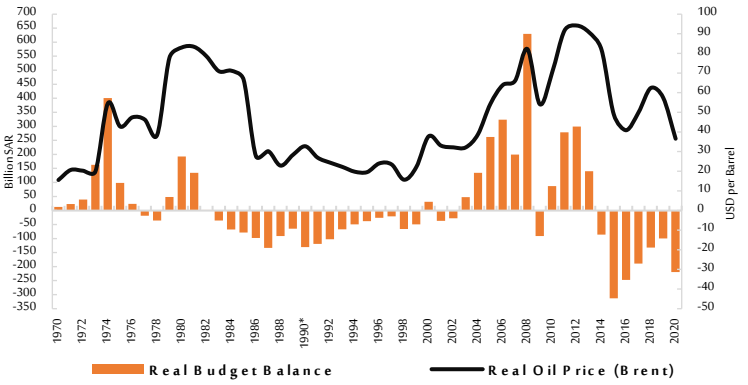

Figure 2. Budget Balance and Oil Price in Real Terms (1970−2020). Source: Saudi Central Bank, OPEC, and Authors' Estimation.

Figure 3 illustrates the relationship between non-oil GDP growth and government expenditure. The results provide evidence that non-oil GDP growth could not have been associated with the high total expenditure, especially in the last period. During the 2016–2020 period, the average total expenditure was approximately SAR764 billion, which is the highest level across all the periods considered. This high total government expenditure was found to be associated with the second-lowest non-oil GDP growth—approximately 2.5%. This shows that the level of total expenditure cannot explain the underlying (or the whole) role played by fiscal policy in the non-oil GDP, especially in the short term.

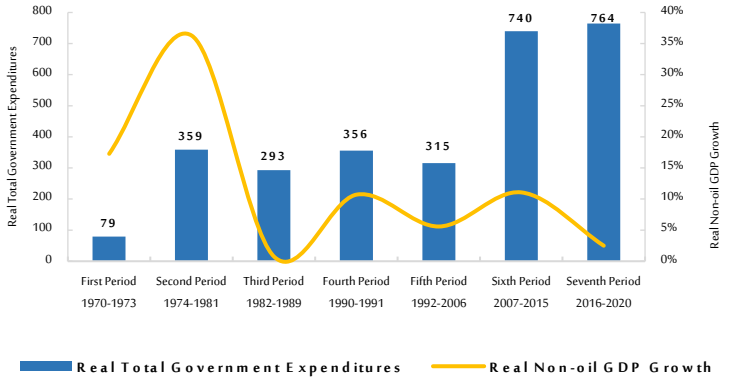

Figure 3. Real Total Expenditure and Real Non-oil GDP Growth (1970−2020). Source: Saudi Central Bank and OPEC.

However, three factors could determine the underlying role played by fiscal policy and its impact on non-oil GDP performance: the source of revenue, budget deficit financing,

and the types of expenditure. The first factor involves raising taxes and fees in an attempt to diversify and increase other revenue, while issuing internal public debt. The second relates to financing budget deficits by tapping the accumulated reserves, while issuing external public debt. The last factor entails cutting total expenditure in favour of the current expenditure, which is inflexible and mainly dominated by the compensation of employees. Thus, the underlying role played by fiscal policy can be determined by these three factors. Therefore, we redefine government expenditure based on its sources—i.e., internally and externally financed expenditure—as is shown in Figure 4. Internally financed government expenditure is financed by internal economic sources, such as taxes, fees, and internal debt. Thus, all these sources have destructive effects on non-oil GDP, as they reallocate sources from the more efficient private sector to a less efficient sector.

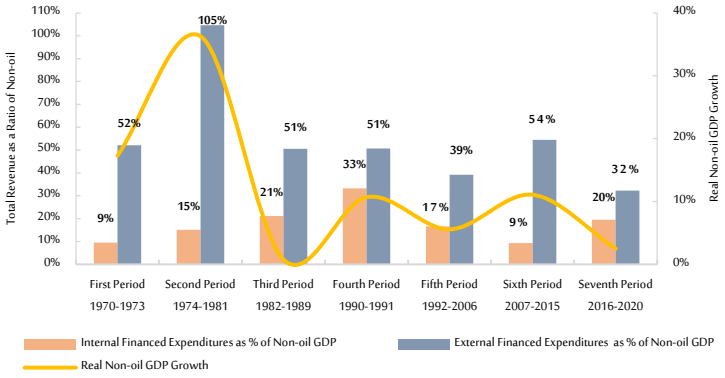

Figure 4. Sources of Expenditure and Real Non-oil GDP Growth (1970−2020). Source: Saudi Central Bank and OPEC.

Conversely, externally financed government expenditure is financed by external sources such as oil revenue, government reserves, and external debt. These sources have a positive impact on non-oil GDP, as they provide the economy with newly injected money. This high non-oil GDP growth is associated with high ratios of externally financed expenditure and low ratios of externally financed expenditure. For example, the highest non-oil GDP growth was associated with the highest externally financed expenditure and relatively low ratios of internally financed expenditure. On the other hand, the lowest non-oil GDP growth was associated with the highest ratios of internally financed expenditure found in the third period. Thus, high non-oil GDP growth appears to be associated with high externally financed and low internally financed expenditure.

4. Data and Empirical Methodology

4.1. Data

To estimate fiscal multipliers for Saudi Arabia, we used annual data provided by the SAMA database for the 1980–2020 period. We used non-oil GDP, private non-oil GDP, private investment, private consumption, government spending, current spending, investment spending, and non-oil revenue.

Government spending includes all government consumption (government purchases of goods and services), investment, transfer payments and interest payments. Current Spending includes government purchases of goods and services and transfer payments.

All considered variables were log-transformed and a GDP deflator was used to deflate them. Following the work of Espinoza and Senhadji (2011), we focused on the non-oil GDP and its private components, rather than on total GDP. While earlier fiscal studies had not examined tax multipliers, an analysis of the dynamic effects of non-oil revenue is timely warranted. Since 2017, the Saudi government has implemented an extensive fiscal reform program that includes spending cutbacks as well as tax and fee hikes in order to deal with the low oil prices. These measures could have a negative impact on output by placing pressure on the private sector (Almarzoqi and Mahmah 2020).

4.2. Empirical Methodology

We estimated fiscal multipliers by means of the local projection (LP) method, as developed by Jordà (2005). This method has some advantages relative to the other methods. First, it can be easily accommodated to estimate the state-dependent model. Second, it does not require high frequency data, which is appropriate in the case of Saudi Arabia.

The linear model is as follows:

$$Z_{t+h} = \alpha_h + \sum_{i=1}^{n} \vartheta_{ih} X_{t-i} + \beta_h shock_t + \varepsilon_{t+h} \qquad h = 0, 1, 2, \ldots 8 \tag{1}$$

where Z denotes the variable of interest, X represents the vector of control variables and shock is the VAR-based fiscal shock. To identify fiscal shocks, we referred to the Cholesky identification method where the ordering is the following: government spending, output, and non-oil revenue.

In our study, Z contains the logs of the real government spending, non-oil revenue, and output, and X consists of lags of the log values of government spending, non-oil revenue, and output. The β_h coefficient is the response of z at horizon $t + h$ to a shock at time t.

Linear projections can be easily accommodated to estimate the state-dependent model. The model can be written as follows:

$$Z_{t+h} = I_{t-1}^{output\ gap} \left\{ \alpha_h + \sum_{i=1}^{n} \vartheta_{ih} X_{t-i} + \beta_h shock_t \right\} + \left(1 - I_{t-1}^{output\ gap} \right) \left\{ \alpha_h + \sum_{i=1}^{n} \vartheta_{ih} X_{t-i} + \beta_h shock_t \right\} + \varepsilon_{t+h} \tag{2}$$

where I_{t-1} is a dummy variable that indicates the position in the business cycle. We considered the output gap as an indicator of the state of the business cycle. We assumed that if the value of the output gap exceeded zero in a particular period, it would be accepted as an expansionary period. Similarly, if the value of the output gap remained below zero, that period would be considered as recessionary.

Moreover, the following non-linear specification was estimated to investigate how the magnitude of fiscal multipliers may change depending upon the direction of fiscal intervention:

$$Z_{t+h} = I_{t-1}^{spending\ direction} \{ \alpha_h + \sum_{i=1}^{n} \vartheta_{ih} X_{t-i} + \beta_h shock_t \} + \left(1 - I_{t-1}^{spending\ direction} \right) \{ \alpha_h + \sum_{i=1}^{n} \vartheta_{ih} X_{t-i} + \beta_h shock_t \} + \varepsilon_{t+h} \tag{3}$$

where I_{t-1} is a dummy variable that indicates the direction of government spending. We used government spending growth to identify contractionary and expansionary fiscal policy. In our case, $I_{t-1}^{spending\ direction} = 1$ if the fiscal policy was expansionary (government spending growth > 0) and $1 - I_{t-1}^{spending\ direction} = 1$ if it was contractionary (government spending growth < 0).

Following the method of Espinoza and Senhadji (2011), we define the fiscal multiplier as the ratio of a change in real output (ΔY) to an exogeneous change in real government spending (ΔG). In this study, we reported the results for two different definitions of the fiscal multiplier—namely, the short-term (impact) multiplier and the cumulative multiplier for a time horizon T = 5. The ratio of impulse responses can be interpreted as elasticity $\left(\alpha = \frac{\Delta Y / \Delta Y}{\Delta G / \Delta G} \right)$, and the multiplier is therefore $\left(m = \frac{\Delta Y}{\Delta G} = \frac{\alpha}{\overline{G/Y}} \right)$. The short-term multiplier is then obtained by dividing the elasticity by the ratio of government spending to output $\left(m^{impact} = \frac{\frac{\Delta Y_0 / Y_0}{\Delta G_0 / G_0}}{\overline{G/Y}} \right)$. The long-term multipliers were obtained by cumulating the impulse responses and dividing the total by the ratio of government spending to output $\left(m^{cumulative} = \frac{\frac{\sum_{j=0}^{N} \Delta Y_t / Y_t}{\sum_{j=0}^{N} \Delta G_t / G_t}}{\overline{G/Y}} \right)$ (Minea and Mustea 2015).

5. Estimation Results

Figure 5 illustrates the impulse response functions (IRFs) of non-oil GDP and private non-oil GDP to government spending and non-oil revenue shocks, respectively. The vertical axe is the plot of response of the dependent variable with respect to the error term one positive standard deviation shock. As predicted by the theoretical and empirical literature, non-oil GDP responds positively in the short term. Cumulatively, the effect remains positive and statistically significant. This could be explained, in part, by the composition of spending shocks. Saudi Arabia has seen a considerable increase in capital expenditure during booms, which often results in longer-lasting multiplier effects. On the other hand, a persistent shock had a relatively small impact on private non-oil GDP as, starting from period 5, the response was found to be positive but not statistically significant.

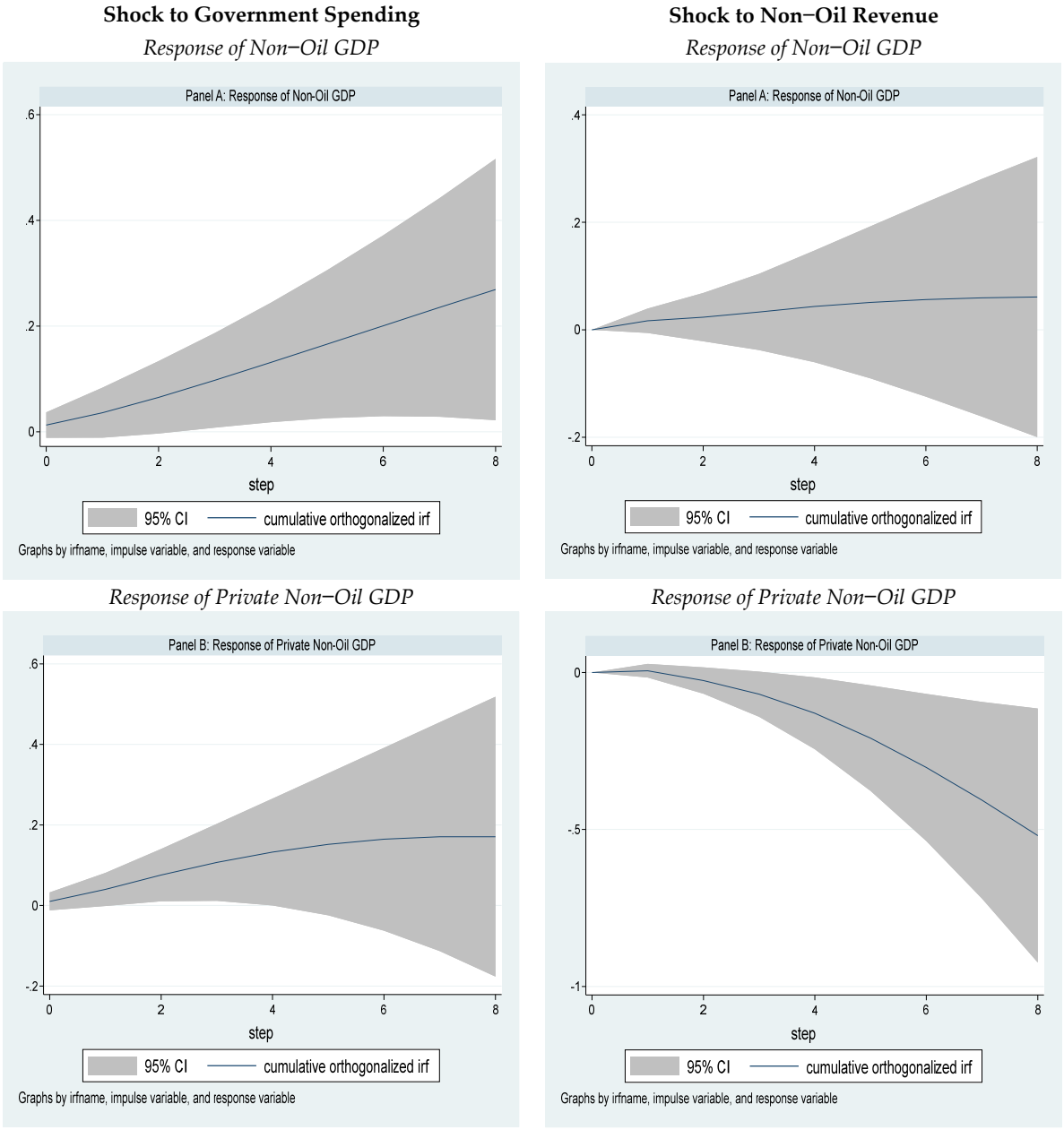

Figure 5. Impulse Response of Shocks in Government Spending and Non−Oil Revenue.

The responses of output to positive shocks in non-oil revenues show that private non-oil GDP responses are positive but not statistically significant on impact, they become

negative and statistically significant in period 2. On the other hand, non-oil GDP was found to respond positively but to a non-statistically significant degree. This is in line with a priori expectations, as higher taxes increase the cost of doing business for the private sector and reduce households' disposable income, which translates into lower output. According to Almarzoqi and Mahmah (2020), increasing non-oil revenue has resulted in increases in government spending, which have helped to enhance overall consumption and, to a lesser extent, private investment. On the other hand, these sustained increases in revenue have caused increases the cost of doing business and decreases in disposable income, which have weakened private investment and consumption.

As shown in Table 1, government spending multipliers ranged between 0.09 and 0.19 in the short term and between 0.31 and 0.38 in the long term. In the short term, we found the non-oil revenue multipliers to be non-statistically significant. In the long term, we found the corresponding multipliers to equal −1.90 when we considered private non-oil GDP.

Table 1. Fiscal Multipliers: The Baseline Specification.

		Non-Oil GDP	Private Non-Oil GDP
Government spending	1 year	0.198 *	0.096 **
	3 years	0.589 *	0.401 **
	5 years	0.314 **	0.388
Non-Oil Revenue	1 year	0.157	0.181
	3 years	0.187	−0.710 *
	5 years	0.546	−1.906 **

Source: Author's Calculations. Notes: ** and * denote the significance at 5% and 10% respectively.

According to the literature, the economic impact of current spending changes differs from that of investment spending. Current spending generates a higher short-term impact because it increases disposable income, while investment spending has a more considerable long-term effect because it combines the short-term demand effects and the long-term supply impacts.

Figure 6 presents IRFs of current and capital spending shocks, respectively. Following a positive current spending shock, non-oil GDP and private non-oil GDP responded positively and significantly both on impact and in the long term. Conversely, following raises in investment spending, non-oil GDP and private non-oil GDP were found to decrease both on impact and in periods 2 and 3, and to increase in periods 4 and 5 (albeit with a weaker significance).

As shown in Table 2, The current spending multiplier was higher in the short term, but investment spending had a greater cumulative effect. The current spending multiplier was equal to 0.4 on impact and decreased to 0.3 in the long term, when non-oil GDP was considered. This finding implies that, in Saudi Arabia, there is a significant disposable income channel, meaning that current expenditure is a stronger countercyclical measure. However, such a channel seems to have effects even in the short term, as the cumulative multiplier decreased over time.

Table 2. Fiscal Multipliers: The Disaggregated Specification.

		Non-Oil GDP	Private Non-Oil GDP
Current spending	1 year	0.393 ***	0.244 ***
	3 years	0.766 ***	0.485 ***
	5 years	0.321 ***	0.277 ***
Capital spending	1 year	−0.067 *	−0.105 *
	3 years	0.285	0.075
	5 years	0.413	0.295

Source: Author's Calculations. Notes: *** and * denote the significance at 1% and 10% respectively.

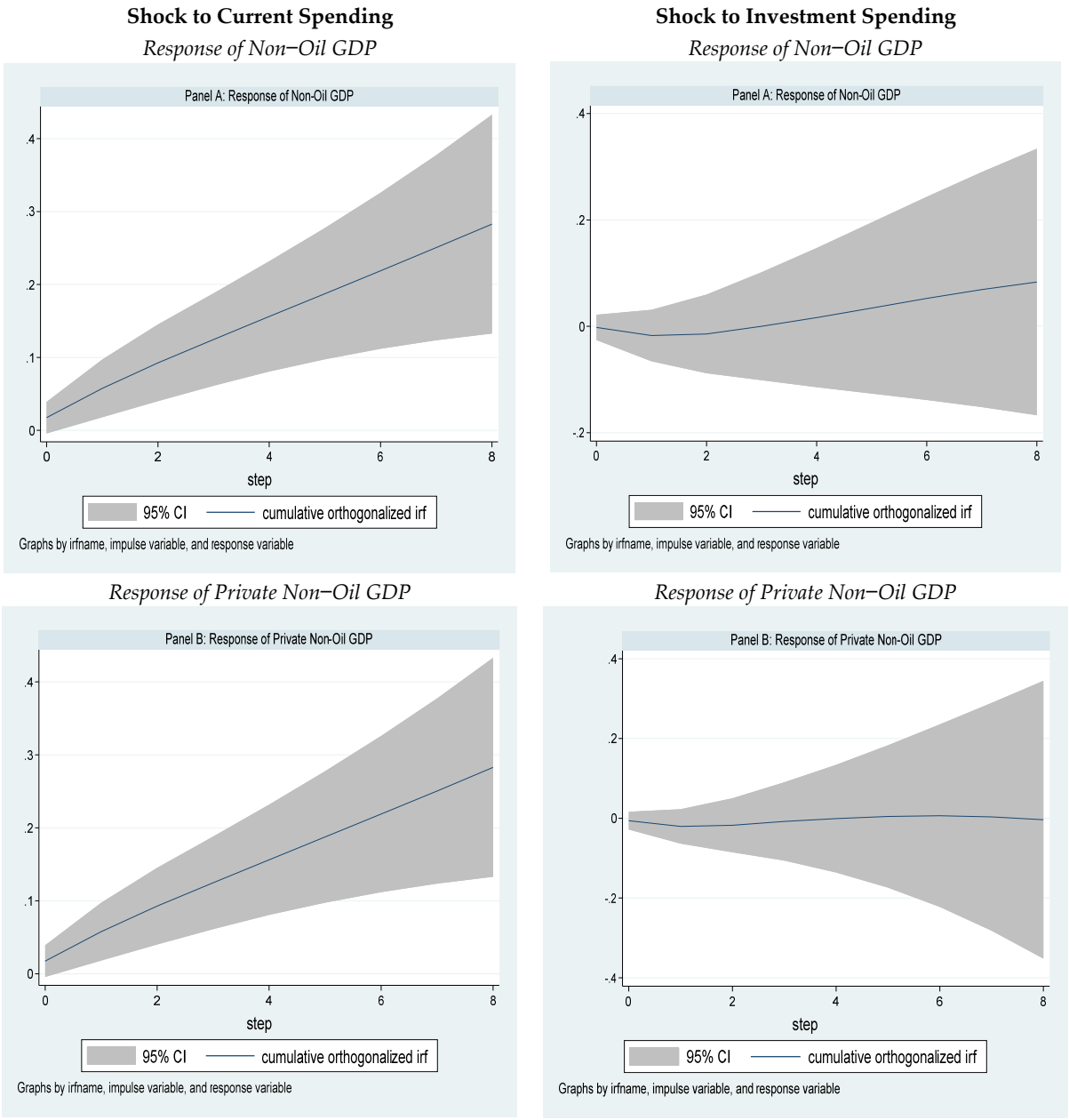

Figure 6. Impulse Response of Shocks in Current Spending and Investment Spending.

Surprisingly, the impact multiplier for investment spending reached a negative value (−0.06). Over time, the cumulative multiplier increased to 0.4 in the fifth year. These results are consistent with the estimated impact of fiscal shocks reported by Espinoza and Senhadji (2011), the IMF (2016), and Al Moneef and Hasanov (2020), who found that investment spending has a more considerable impact than current spending in the long term.

Overall, our results suggest that fiscal multipliers are moderate, which reflects the country-specific fundamentals of the Saudi economy. The first factor is the large crowding-out effect found in Saudi Arabia due to the substantial import intensities in both production and consumption. Another factor that may yield small multipliers is the wealth effect, in which consumers and investors begin to change their behaviours in order to prepare for future taxes and fees to correct for the initial expansion, which may cause them to reduce their current consumption and investment (Almarzoqi and Mahmah 2020).

The cumulative multipliers we obtained for non-oil GDP are somewhat higher than those found for private non-oil GDP. This likely reflects the weakness of the spillover effect of public spending shocks to the private sector.

The effect of government spending and non-oil revenue shocks on private consumption and private investment are presented in Figure 7. The IRFs show a significant positive response of private consumption to spending shocks, closely tracking the responses of output. The result provides strong evidence regarding the presence of a significant disposable income channel in Saudi Arabia.

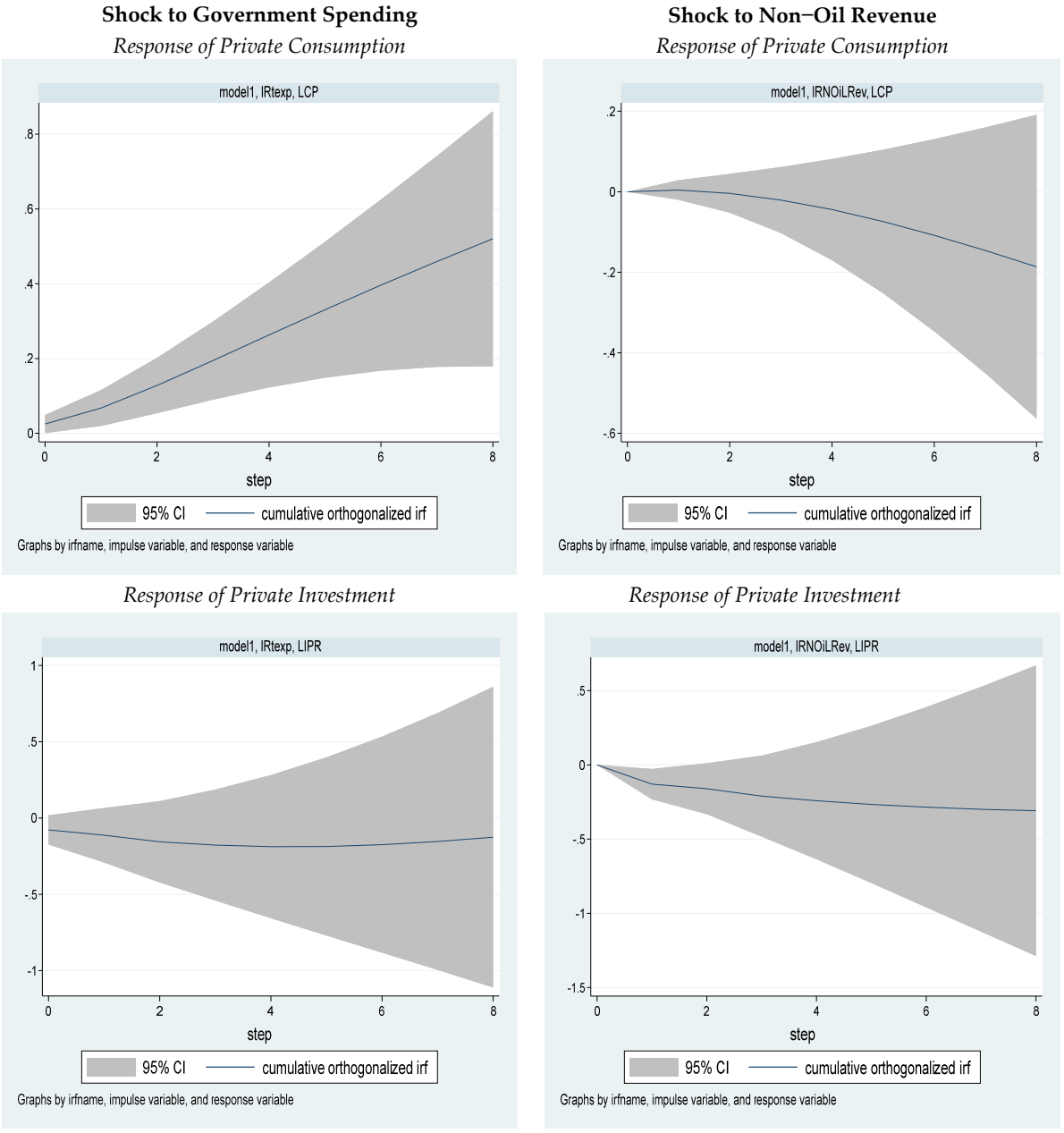

Figure 7. Impulse Response of Shocks in Government Spending and Non-Oil Revenue on Private Consumption and Investment.

Government spending shocks yield negative and non-statistically significant responses from private investment. A one SAR rise in government spending has a severe crowding-out effect on private investment, resulting in a reduction in impact. This negative impact persists over the long term. In Saudi Arabia, such crowding-out effects are caused by increases in the cost of loans as a result of governmental debt increases aimed at financing the budget (Almarzoqi and Mahmah 2020). Furthermore, increased government expenditure in

the form of greater public wages places upward pressure on the equilibrium wage, raising the cost of private investment and making it less desirable.

In most cases, the responses of private consumption and investment to non-oil revenue are negative but not statistically significant. This portends that the rise of non-oil revenue negatively affects the private sector through three channels: the wealth effect, the increase in the cost of loans, and the cost of doing business. This result supports Almarzoqi and Mahmah's (2020) conclusion that increased non-oil revenue places an additional burden on the private sector, causing reduced disposable income to reduce investment and consumption.

In the next step, we estimated state-dependent fiscal multipliers under two regimes (expansion and recession), as illustrated in Figure 8 and Table 3. The results showed that the estimated multipliers were stronger in expansions than in downturns, which supports the evidence for the non-linear effects of fiscal policy in Saudi Arabia. During expansion periods, the short-term multiplier ranged between 0.30 and 0.33 and the long-term multiplier ranged between 0.65 and 0.75, depending on whether we considered non-oil GDP or private non-oil GDP. However, during recession periods, the estimates of spending multipliers decreased to between 0.20 and 0.22 for short-term multipliers and between 0.43 and 0.49 for long-term multipliers. One possible explanation for our findings is that procyclical fiscal policy prevails during recession periods. These results differ from those obtained by Auerbach and Gorodnichenko (2010, 2011), Elkhdari et al. (2018), and Al Moneef and Hasanov (2020), who found higher spending multipliers during bust times and insignificant multipliers during boom times.

Table 3. State-Dependent Government Spending Multipliers: The Effects of the Business Cycle.

	Non-Oil GDP			**Private Non-Oil GDP**		
	1 year	3 years	5 years	1 year	3 years	5 years
Expansion Periods	0.309 *	0.716 **	0.657 **	0.334 *	0.706 **	0.755 **
Recession Periods	0.204 *	0.471 **	0.433 **	0.220 *	0.466 **	0.497 **

Source: Author's Calculations. Notes: ** and * denote the significance at 5% and 10%, respectively.

Table 4 and Figure 9 show how output responds to positive or negative spending shocks. We found differing consequences for expansionary and contractionary spending shocks. Whereas negative spending shocks have stronger adverse impacts on economic activities, positive spending shocks have marginal positive effects on non-oil GDP. For expansionary spending shocks, the short-term multiplier ranged between 0.14 and 0.18 and the long-term multiplier ranged between 0.43 and 0.77, depending on whether we considered non-oil GDP or private non-oil GDP. However, for contractionary spending shocks, the estimates of spending multipliers equalled 0.23 for short-term multipliers and ranged between 0.23 and 0.93 for long-term multipliers. In light of the asymmetries outlined here, a fiscal package stimulus will be less effective to stimulate output, whereas fiscal adjustment could generate stronger adverse effects on the economy.

Table 4. State-Dependent Government Spending Multipliers: The Effects of Fiscal Intervention.

	Non−Oil GDP			**Private Non−Oil GDP**		
	1 year	3 years	5 years	1 year	3 years	5 years
Expansionary fiscal policy	0.148	0.613	0.431	0.183	0.949	0.776
Contractionary fiscal policy	0.236	0.636	0.484	0.230	1.041	0.933

Source: Author's Calculations.

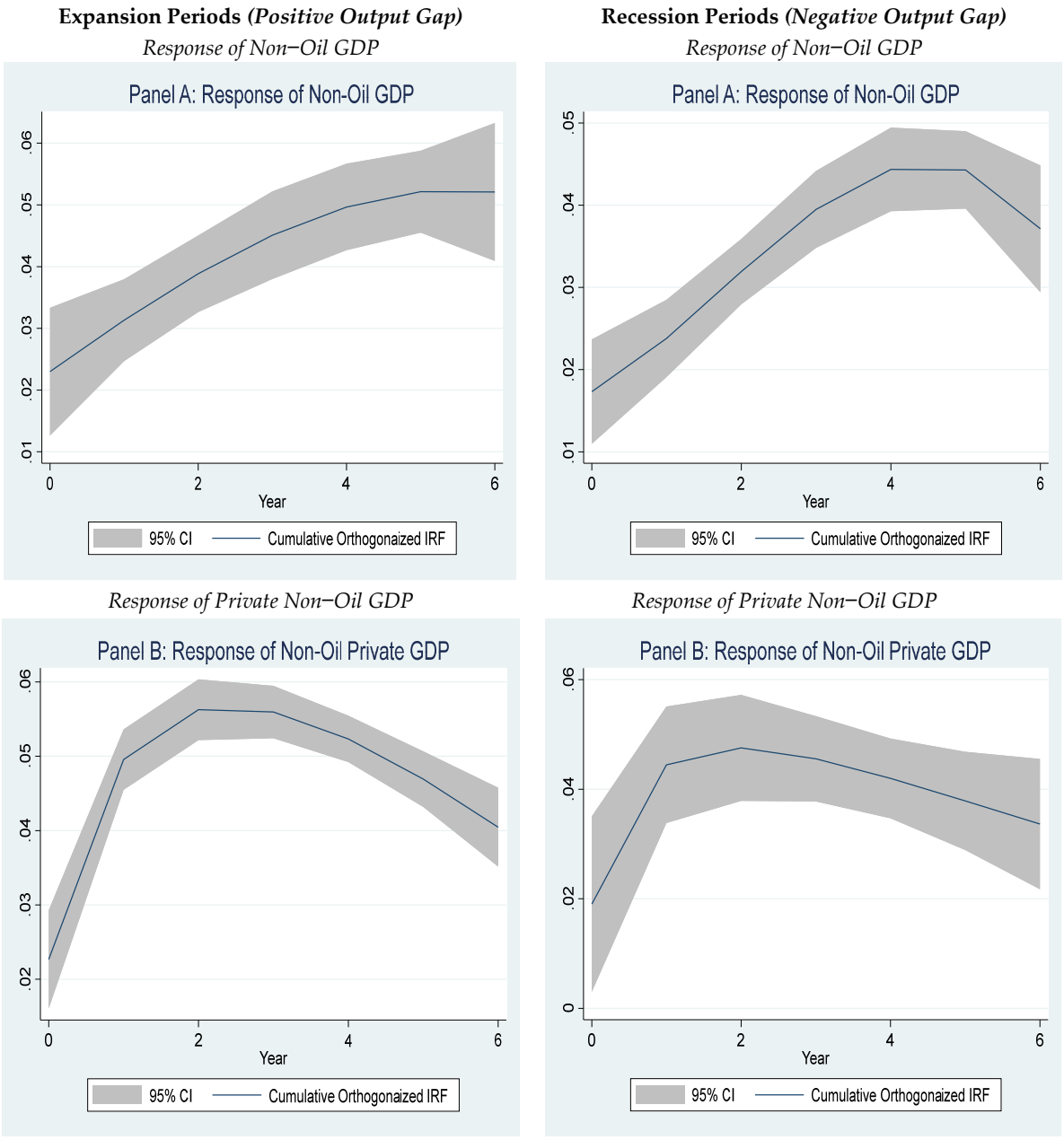

Figure 8. Impulse Response of Shock in Government Spending Depending on the State of the Business Cycle.

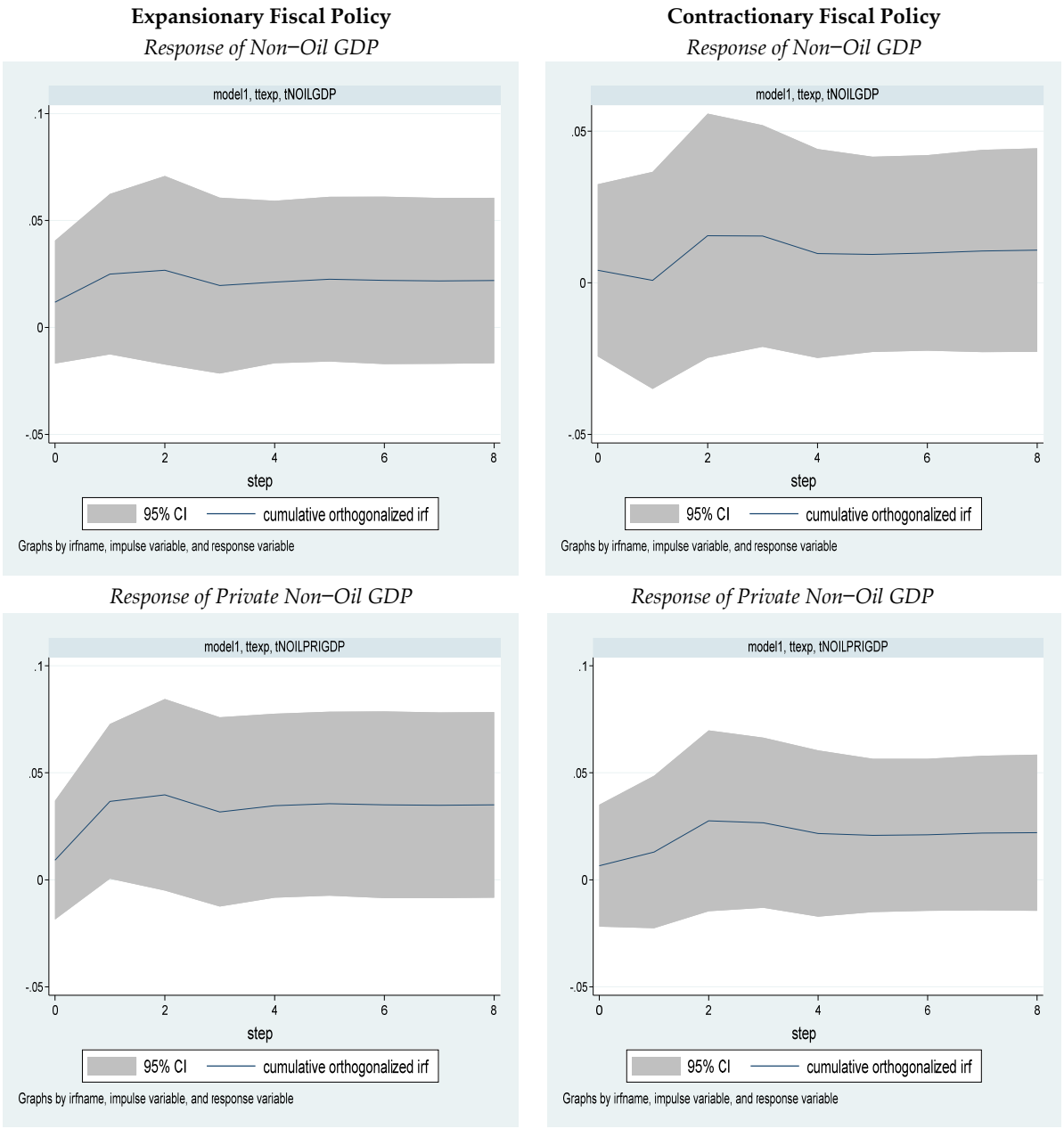

Figure 9. Impulse Response of Shock in Government Spending Depending on the Direction of the Fiscal Policy.

6. Discussion and Policy Implications

Saudi Arabia is an oil-exporting country in which the government and the short-term fiscal policy play a stabilizing role in the economy. Therefore, having a measure of fiscal multipliers, becomes a central objective for fiscal policy decision-making. This paper provides reliable estimates of fiscal multipliers.

We found that fiscal multipliers are moderate as suggested by previous studies. This can be related to the concerns about the crowding out and Ricardian equivalence effects. Moreover, our results confirmed previous results that emerging countries have smaller multipliers than developed countries. Ramey (2019) and Hall (2010) provide a review of the recent empirical literature on fiscal multipliers. The evidence from developed countries suggests that spending multipliers are likely to be between 0.5 and 2. Second, we estimated slightly smaller multipliers than those yielded by previous studies conducted on Saudi Arabia (Al Moneef and Hasanov 2020). Third, we found capital multipliers to be larger than current multipliers. Fourth, any increase in non-oil revenue pressures the private

sector to increase affected taxes and reduce disposable income and thereby weakens private consumption and investment, which translates into lower output.

Based on the nonlinear specification, our empirical findings provide strong evidences for the presence of nonlinear effects of fiscal policy. First, we control for business cycle, results show that fiscal multipliers are stronger in expansions than in downturn. This finding contradicts those of Auerbach and Gorodnichenko (2010, 2011) and Ramey and Zubairy (2018), who concluded that spending multipliers are higher in times of recession than in times of expansion. On the other hand, contractionary spending shocks have a larger adverse impact on economic activities, whereas expansionary spending shocks have marginal positive effects on non-oil GDP.

The moderate size of multipliers, which suggests a limited output effect of countercyclical fiscal policy, also points to a decrease in the efficiency of fiscal spending or crowding out of the private sector. Alternatively, as the Saudi government has intensified its efforts to increase non-oil revenue to finance its expenditure, these fiscal reforms could put pressure on the private sector and disposable income, reducing the impact of spending. These measures will eventually increase the overall savings of the private sector (the Ricardian equivalence), uncertainty in private sector future taxation, and the cost of doing business, which could hamper the competitiveness of non-oil exports.

In terms of our study's policy implications, policymakers should consider the nonlinear effects of fiscal policy when carrying out policy-oriented studies. The state of the economy, as well as the direction of fiscal intervention, should be taken into account while formulating fiscal policies. To limit the adverse impact of fiscal consolidation measures, governments are asked to reduce (less productive) current spending and protect (efficient) investment expenditure. Second, the economic benefits of increasing capital spending could be higher than those of increasing current spending. Third, the results also recommend against enacting any rise in revenue at the expense of cutting subsidies, implementing VAT, and introducing fees and taxes, which could place more pressure on the private sector. These measures eventually increase the cost of doing business. To offset its negative side effects, the Saudi government needs to gradually implement these types of policy reforms. Third, our findings raise concerns regarding macroeconomic stabilization challenges in Saudi Arabia, given the large terms of trade shocks and the lack of an independent monetary policy. Therefore, the presence of a credible fiscal rule to constrain discretionary fiscal policy could be an effective tool for macroeconomic stabilization, as well as for long-term diversification goals.

7. Conclusions

This study contributes to the existing literature on fiscal multipliers in oil-exporting countries by providing estimation of linear fiscal multipliers and state-dependent multipliers for Saudi Arabia. While the findings confirm standard estimates of linear multipliers in the region, they also suggest that these multipliers hide substantial differences under different economic circumstances.

We conclude generally from the previous results that: the presence of relatively small multipliers suggests that the efficiency of expansionary fiscal policies is rather limited. The high investment spending multipliers gives evidence that increasing capital expenditure is likely to be more effective than increasing consumption as an improvement in potential output requires more productive investment and capital accumulation. In times of expansion, multipliers tend to be higher than in times of recession. This may lead us to consider the particularities of oil exporting countries, which make the fiscal policy transmission channel different.

The work presented in this paper could be expanded fruitfully in several ways. One way would entail looking into the questions raised by the results. For example, why do oil-exporting countries feature smaller fiscal multipliers than developed ones? Another direction could involve assessing fiscal multipliers across different states of the economy, with a focus on the fiscal position. Finally, the use of annual data, rather than quarterly

data, is the main shortfall of our study. Compared to annual data, quarterly data allow a better identification of structural shocks (Ilzetzki et al. 2013). Moreover, quarterly data bring a considerable increase in the number of degree of freedom (Combes et al. 2016): this becomes crucial if the time span under analysis is not very large, as it is in our case.

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