Fiscal Multipliers in Resource-Rich Economies: Evidence from the Gulf Countries*

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Abstract

This paper utilizes the unique dynamics of fiscal budgeting in countries with a large hydrocarbon sector to estimate fiscal multipliers. The main identifying assumption rests on the idea that exogenously identified global hydrocarbon demand shocks can be considered plausible instruments for the fiscal space of countries in which that space is significantly dictated by hydrocarbon income, with such shocks being uncorrelated with non-hydrocarbon output at the same time. Using a local projection-instrumental variables (LP-IV) framework, the paper estimates that short-run fiscal expenditure multipliers to be in the ballpark of 0.1-0.4. In addition, we find that multipliers are at the upper end of this interval during recessions, indicating that fiscal policy in the Gulf countries is particularly effective during economic downturns.

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JEL Codes: E62, H60.

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1 Introduction

One of the most contested objects in macroeconomic research has been the fiscal multiplier: the effect of an underlying change to fiscal policy on domestic output. Determining the size of fiscal multipliers sheds light on the effects of government expenditure and income in influencing business cycle-frequency dynamics, allowing the policymaker to use the fiscal instruments at their disposition to stabilize especially demand-driven business cycle dynamics as necessary. However, the estimation of fiscal multipliers has to overcome the simultaneity bias inherent to fiscal policy. Because of this simultaneity bias, a particular burden is placed on the identifying assumptions that allow the researcher to exploit meaningful (quasi-)exogenous variation by which the impact of fiscal policy measures can be recovered.

We contribute to this ongoing debate by providing evidence from a particular geographical area, namely, the member countries of the Gulf Cooperation Council (GCC). Its member countries can be considered particularly informative for the debate on the size of fiscal multipliers as significant portions of the income earned by the GCC sovereign entities are effectively sourced in the sales and export of pure and refined hydrocarbons. As an illustrative example, in the period for which we have quarterly data available, the share of fiscal revenue directly attributable to the production and sales of hydrocarbon products ranges between 53% and 92% in Saudi Arabia, and between 85% and 95% in Kuwait. While this share of fiscal capacity related to hydrocarbon generation is steadily declining across the GCC economies in the light of ongoing economic diversification efforts, the fiscal situation of all GCC member countries in the past 15 years has been majorly shaped by dynamics underpinning global hydrocarbon markets. Our contribution will be to leverage this partial exogeneity of the fiscal space in GCC economies to inform estimates of fiscal multipliers. We will work both with shocks deduced from previous expenditure and income dynamics as well as with exogenous hydrocarbon demand shocks to inform fiscal variables, whose influence on non-hydrocarbon output we can then pin down by instrumenting government expenditures and income appropriately.

We begin by introducing our econometric methodology and the running identification assumption for our data-driven approach. In sum, we isolate the cyclical component of fiscal income and expenditure variables, and instrument this with a Blanchard and Perotti (2002)-style unexpected component of the respective fiscal variable *and* the world oil demand shock component recovered by Baumeister and Hamilton (2019). We then estimate the effect of the instrumented fiscal variable on *non-hydrocarbon* output, as this part of the overall economic activity is the one most directly influenced by fiscal variables. These two steps are nested within a Local Projections-Instrumental Variables (LP-IV) framework, allowing us to recover econometrically meaningful estimates despite our limited sample size (Jordà and Taylor, 2025; Montiel Olea et al., 2025). Our definition of fiscal multipliers is narrow, in line with the academic literature (Ramey and Zubairy, 2018), isolating solely the ability of fiscal policy to stabilize output fluctuations around an underlying long-run trend.

Subsequently, we present our results. Estimated fiscal multipliers on government expenditures are broadly positive within the interval 0.1-0.4 in the short-term. Fiscal multipliers on government revenues do not deliver a similarly clear picture and are frequently insignificantly different from zero. Separating our multiplier estimation into periods of recessions and expansions, we additionally find that positive multipliers on government expenditures are particularly present when the underlying state of the economy is recessionary; that is, fiscal policy appears to be a more useful tool during times of economic dearth.

In terms of policy-relevant messages, our results indicate that fiscal policy is broadly effective at stabilizing cyclical fluctuations of (non-hydrocarbon) output, especially during times of economic dearth. While fiscal multipliers in the GCC appear to be positive across the board, they are generally less than one, in line with the estimates in the literature for a multitude of other countries. Policymakers should therefore not expect 'multiplying' effects (i.e., fiscal multipliers *larger* than one) in response to stabilizing fiscal policy measures, which occur for fiscal multipliers that are larger than one. Since the effects are at the same time significantly positive, policymakers can however expect a reasonable impact of fiscal policy on output. As the estimated multipliers are significantly larger during recessions, a corollary of the findings is that they make a robust case for countercyclical fiscal policy. Such countercyclical policy should aim at an expansion of demand through fiscal stimulus especially during demand-driven downturns.

Literature Review

There is a fundamental causality problem that needs to be overcome when estimating fiscal multipliers. It is generally possible that government expenditures boosts aggregate output; likewise, it is feasible for aggregate output to feed back to government expenditures. The task of overcoming this econometric identification problem has been at the heart of estimating the effects of fiscal policy for decades. For long periods of time, data and methodological limitations led to the construction of quasi-exogenous variation with specific identifying assumptions being chosen for a given data context. This was done, for instance, in Blanchard and Perotti (2002). Other approaches included the exploitation of a very limited degree of truly exogenous variation (in particular military expenditures, as in Auerbach and Gorodnichenko (2012)). Recent methodological improvements, highlighted in particular by Ramey (2016) and Jordà and Taylor (2025), facilitate the estimation of fiscal multipliers in our context despite the present data limitations.

While we are not the first to analyze fiscal dynamics of GCC economies, we innovate on a number dimensions: first, we bring a battery of instruments to the table that are plausibly altering fiscal capacities across all GCC economies, but are not driven explicitly by local economic conditions. Second, previous studies of fiscal multipliers in the GCC relied on *annual* data and identification schemes following Blanchard and Perotti (2002), which has been the prevailing standard due to data availability constraints.[1] That approach faces the drawback that the fundamental identifying

[1]The literature has been surveyed in IMF (2024), with a particular focus on the size of fiscal multipliers in Saudi

assumption behind the identification scheme of Blanchard and Perotti (2002) is likely to be contradicted when using annual data, since one cannot plausibly rule out contemporaneous feedback of GDP on fiscal variables within the same *calendar year*.

The literature standard for overcoming the simultaneity bias in the estimation of the effects of fiscal policy has for decades been the use of SVARs, overcoming the simultaneity bias by restricting the contemporaneous effects of variables on one another in certain directions, for instance through a Cholesky decomposition. SVARs, however, suffer from a small sample bias that has been known at least since Nicholls and Pope (1988).[2] Additionally, SVAR techniques require extra care with respect to any underlying confounders that could influence the size of the estimated fiscal multiplier. As pointed out by Ilzetzki et al. (2013), this includes in particular the exchange rate regime, as fixed exchange rate regimes should yield higher fiscal multipliers.[3]

In contrast to the existing studies for the GCC countries, we leverage newly minted data ranging from 2010 to 2024, inclusive, in quarterly frequency, facilitating improvements in the identification of fiscal shocks. We leverage novel econometric insights summarized by Ramey (2019) and Jordà and Taylor (2025) in combination with a set of externally identified shocks to oil demand to pin down fiscal multipliers in an econometrically more rigorous way. To that goal, we utilize single-equation local-projection methods (Jordà, 2005; Jordà and Taylor, 2025), which face benign econometric properties even at such short sample periods. Note that the small sample bias mentioned previously can still persist under estimation with local projections; however, under a proper specification it is a comparatively smaller issue. In particular, possible misspecifications of the lag length of the underlying true data-generating process are of reduced importance as possible biases do not accumulate due to the absence of a cross-dependence across equations (Jordà et al., 2024). This holds true particularly for *long-differenced* local projection specifications, under which the extent of such biases has been shown to matter considerably less (Piger and Stockwell, 2025).

Our novel identifying assumption exploits the degree to which hydrocarbon sales shape fiscal policy in GCC countries. A significant part of economic activity can directly be traced back to the extraction, refinement, and sale of hydrocarbon products. Our idea is therefore to leverage *demand-driven shocks* to the hydrocarbon market to isolate an exogenous component driving the government budget. This can be used to instrument government expenditures (or income) in an

Arabia, the largest of the GCC economies. Hemrit and Benlagha (2018) find multipliers for fiscal spending in the magnitude of 0.1 - 0.8, using a structural VAR approach with annual data. This approach is shared by Al Moneef and Hasanov (2020) (who find a spending multiplier of 0.3) and Al Marzoqi et al. (2023) (who find a spending multiplier of 0.45). Hasanov et al. (2022) estimate an ARDL model relating government expenditure to non-oil GDP and find a spending multiplier of 0.25. Finally, the IMF (2024) itself provides an estimate relying on a 'bucket approach' with limited quantitative evaluation. Their spending-to-output multiplier estimate lies at 0.6.

[2]Asymptotically, VARs and LPs should recover the same structural impulse-responses if the local projections include as contemporaneous controls the same variables that appear first in the corresponding Wold ordering of the VAR estimated under a Cholesky identification scheme, see Plagborg-Møller and Wolf (2021) for details.

[3]The GCC countries generally share a number of elements of their respective economic structures, but a number of differences with respect to the precise nature of trade openness, labor force participation rates, or the degree of hydrocarbon dependence exist. Exchange rate policies are broadly similar, with all currencies but the Kuwaiti dinar being pegged to the USD; and the Kuwaiti dinar being pegged to an undisclosed basket of currencies.

estimation of the effect of government expenditures on *non-hydrocarbon GDP*, which is plausibly not endogenous with respect to the hydrocarbon demand shock.[4] As such exogenous series, we primarily leverage the oil demand shock series of Baumeister and Hamilton (2019).

Considerations related to the *cyclicality* of fiscal policy also matter for our later discussion in terms of the plausible state-dependence of fiscal multipliers. As Bogetić and Naeher (2025) point out, fiscal expenditures are countercyclical in Bahrain, Kuwait, Saudi Arabia, and the UAE, while being acyclical in Oman and slightly procyclical in Qatar. Fiscal revenues across the GCC countries are generally countercyclical, contrary to general intuition, which helps us reconcile our revenue-side multiplier estimates with the rest of the literature. Supporting this idea, Vagliasindi and Gorgulu (2021) and Mendes and Pennings (2025) find that acyclical or countercyclical fiscal policy can be especially preferable if the country's exchange rate policy is characterized by currency pegs, as is the case in GCC countries.[5]

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The remainder of the paper is structured as follows. Section 2 introduces the econometric methodology we use and introduces the identification scheme in detail, followed by a description of our data sources in section 3. Next, section 4 provides our headline multiplier estimates, characterizing our evidence on the efficacy of fiscal income and expenditure policies for macroeconomic stabilization across business cycles in the GCC region. Finally, section 5 concludes with broad policy recommendations.

2 Econometric Methodology

We first introduce our econometric methodology. The goals guiding our choices pinning down the econometric specification are (i) to establish the plausible exogeneity of the variation in fiscal policy parameters that we are searching, and (ii) to characterize the usefulness of local projections in the light of the bias-variance trade-off inherent in our estimation due to limited data availability.

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We start by defining the *fiscal multiplier* for the purpose of our estimation. Two types of multiplier definitions exist in the literature. The *present-value multiplier*, which is defined as the discounted sum of output changes over some interval $\{0, ..., T\}$, divided by the discounted sum of changes in the fiscal variable over the same time interval; and the *peak-value multiplier*, defined as the maximum change in output from the moment of the identified fiscal policy change until some point T, divided by the maximum response of the underlying fiscal variable.

While the peak-value multiplier has been used in seminal contributions (Blanchard and Perotti,

[4] This would obviously not hold true for *total* GDP, which clearly constitutes to a significant part of hydrocarbon sales. But insofar as we want to retrieve the impact of fiscal expenditures on the parts of GDP that are most directly influenced by it, our restriction to non-hydrocarbon GDP as an outcome variable is natural.

[5] Vagliasindi and Gorgulu (2021) furthermore point out that a less open economy, lower levels of public debt, recessions, and accommodative monetary policy all increase the size of fiscal multipliers.

2002; Perotti, 2005), the peak-value multiplier can significantly bias the true effects of fiscal policy by forgoing intertemporal considerations of households and firms alike (Ramey and Zubairy, 2018). In line with that evidence, we work here with the *present-value multiplier*. Denoting by FP_t the fiscal policy impulse of interest, by Y_t the output quantity of interest, and by i the nominal interest rate, we broadly define the fiscal multipliers analyzed in this paper as:

$$FM_t = \frac{\sum_{t=0}^{T} \left(\frac{1}{1+i}\right)^t \Delta Y_t}{\sum_{t=0}^{T} \left(\frac{1}{1+i}\right)^t \Delta FP_t} \frac{\bar{FP}}{\bar{Y}}, \tag{1}$$

where the forecast horizon T is dynamic; that is, we evaluate the fiscal multiplier dynamically over some horizons T. Effectively, we measure the cumulative response of output in unit terms following a fiscal impulse (through expenditure or income changes) of 1 unit. A multiplier of 0.1, for instance, implies that a 1 unit cumulative change in the fiscal variable changes output by 0.1 units. The definitions of output and fiscal variables matter for the correct interpretation of the multiplier, as will be detailed below.

We decided to utilize plausibly exogenous innovations influencing the conduct of fiscal policy in a Local Projections framework while instrumenting the fiscal policy variable of interest with that exogenous variation. The single-equation nature of local projection estimation eliminates the cost of cross-restrictions inducing some bias, coming at the cost of higher estimation variance (Montiel Olea et al., 2025). Since the estimation of fiscal multipliers (especially in limited samples) is susceptible to some bias (Jordà and Taylor, 2025), we consider local projections to be generally beneficial within the context of our estimation exercise. Additionally, the single-equation nature of the estimation allows for a number of easy-to-implement manipulations, such as state-dependence or panel estimation, with manageable econometric cost.

We present here one example specification of the local projections that we estimate, where the fiscal impulse of choice is government expenditures, denoted by g_t. Following best-practices in the literature (Inoue et al., 2025; Jordà and Taylor, 2025), we estimate our local projections in a *long-difference specification*, analyzing the change of the outcome variable of interest from period $t-1$ to period $t+h$, where $h \in \{0, ..., H\}$.

$$\begin{aligned} y_{t+h} - y_{t-1} = \alpha_h + \beta_h \Delta \hat{g}_t + \sum_{l=1}^{L} \big(\gamma_{1h}(y_{t-l} - y_{t-l-1}) + \gamma_{2h}(g_{t-l} - g_{t-l-1}) \\ + \gamma_{3h}(t_{t-l} - t_{t-l-1})\big) + ti + u_{t+h}, \quad \forall h \in \{0, ..., 12\} \end{aligned} \tag{LP-IV}$$

$$\Delta g_t = a + \delta_1 BP_t + \delta_2 BH^1_{t-1} + \delta_3 BH^2_{t-1} + \varepsilon_t, \tag{Instrumenting equation}$$

The equation characterizes our main LP-IV specification, estimating the effects of fiscal expenditures, in first-differences. Here, y_t denotes the chosen measure of output, which in the context

of this paper will be deviations of *non-hydrocarbon* output from its long-run trend (Gordon and Krenn, 2010). α_h is the intercept, while β_h is the main coefficient of interest. As our principal focus here is government expenditures g_t, $\hat{g}_t$ denotes the instrumented government expenditure estimate (again in deviations from its long-run trend), in line with the specification provided in the instrumenting equation. β_h is the effect of instrumented government expenditures on non-hydrocarbon output. Standard control variables are L lags of first-differenced non-hydrocarbon output, L lags of the government expenditure variable itself, and L lags of t_t, which is government income. Note that in specifications of interest concerning the effect of fiscal *income* on non-hydrocarbon output, the roles of g_t and t_t are simply flipped. Additionally, we control for a time-fixed effect ti.

Finding suitable instruments for the fiscal measure of interest (here, Δg_t) is of utmost importance due to the inherent presence of simultaneity bias when estimating the effects of fiscal policy. That instrument must be uncorrelated with the estimation error of the effect of fiscal policy on the output measure, but highly relevant for the fiscal measure of interest. Thanks to the choice of non-hydrocarbon output gaps as the output quantity to target, and thanks to the institutional setup of the GCC, this problem can be addressed robustly. Leveraging previous surprises to global hydrocarbon demand, identified by Baumeister and Hamilton (2019), as exogenous variation in fiscal income yields such an instrument for fiscal variables.

Our least trivial assumption is that these instruments do not violate the exclusion restriction; that is, the joint set of Blanchard and Perotti (2002)-style shocks and the Baumeister and Hamilton (2019) surprise global hydrocarbon demand components does not impact non-hydrocarbon output through any other channel than its effect on government expenditures. This is formally confirmed in most cases using standard testing routines, such as the Sargan-Hansen test.[6] The likeliest concern for the exogeneity restriction is that global demand shocks can affect domestic non-hydrocarbon output through changes to exports. But in the preferred measure, there is no correlation between real exports and the exogenous variation that government income and/or expenditures are instrumented with.[7]. Due to the identification of the shock component in Baumeister and Hamilton (2019) through their structural model, such concerns are unlikely to be highly relevant, even if they are not nullified.

Following Inoue et al. (2025), we construct error bands using a standard Huber-White correction, which is sufficient as we control for past values of our outcome variable. The cumulative fiscal multiplier of interest is directly recovered through the coefficients β_h for the horizons $h = 0, ..., 10$, as the number of available data points is limited.

[6] We use one-period lags of the Baumeister and Hamilton (2019) shock component due to the probable delays in fiscal policy measures in response to such global oil demand fluctuations, but our results are qualitatively robust to using same-period innovations.

[7] One further economic channel that could impact the exclusion restriction of our instrumental variables is related to broad economic sentiments (such as investor confidence), by which stabilizing changes to global fiscal policy are induced while domestic non-hydrocarbon output can also be directly affected through a consumer confidence channel, among others (Jo, 2014; Kilian and Murphy, 2014; Abiad and Qureshi, 2023).

3 Data

We focus on each of the six member countries of the Gulf Cooperation Council: Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates (UAE).[8] Depending on the exercise conducted, we will either analyze each of the six countries separately, or all of them jointly by pooling them appropriately. There are significant similarities in the macroeconomic setting across the six countries of interest: first, all of them are major hydrocarbon exporters: between 10% and 60% of total domestic output can be directly attributed directly to rents from hydrocarbon sales since 2010. Second, the fiscal sector itself matters immensely for any non-hydrocarbon dynamics: in 2023, between 36% (Bahrain) and 84% (Kuwait) of non-hydrocarbon output can be directly attributed to fiscal expenditures. Third, hydrocarbon sales are among the principal sources of fiscal capacity, with the GCC economies featuring a generally narrower tax base.

Data on macroeconomic and fiscal aggregates in quarterly frequency is in part recovered through each of the six GCC member country statistical authorities, and in part through their respective fiscal authorities.[9] We collected data on headline fiscal expenditures and income, as well as on the nature of expenditures (short-term current spending versus long-term capital spending) and the nature of income (hydrocarbon-related income and other income). This data is provided by the statistical authority in Bahrain, Qatar, and Saudi Arabia; and by the fiscal authority in Kuwait, Oman, and the UAE. We manually compiled and aggregated this data, which is not proprietary, but at the same time partially not readily available in a machine-readable intertemporal format.[10] We supplemented this with data on the price of oil (Brent Crude) from FRED and data on sovereign indebtedness by the Bank for International Settlements.

We generally limit our focus to the effects of standalone fiscal policy, limiting the extent to which we connect our results to concurrent monetary policy measures. The reason for this are the exchange rate pegs prevalent across the GCC, which tie domestic monetary policy intrinsically to the conduct of monetary policy in the US.[11] These exchange rate pegs likely matter for fiscal multipliers insofar as previous evidence hints at a link between broadly positive fiscal multipliers and local currency pegs (Ilzetzki et al., 2013).

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Our preparation of the data for the estimation is slightly more involved, since the data provided

[8] While enlarging the sample of countries is principally possible by incorporating other resource-rich MENA economies, for instance, we decided to focus extensively on the six Gulf Cooperation Council countries due to their relatively similar economic structure, characterized, e.g., by exchange rate pegs in most cases to the US dollar.

[9] Macroeconomic aggregates of interest include gross output, output net of hydrocarbon production (defined as the difference of overall output and 'mining-related output', which is readily available across the GCC), demand components of GDP, population quantities, the prevailing interest and exchange rates, the GDP deflator, and the overall production flow of hydrocarbons.

[10] All data can be found as part of the replication package, including the raw files from which we compiled our datasets.

[11] All GCC countries except Kuwait peg their local currency to the US dollar. The Kuwaiti dinar itself is pegged to an undisclosed basket of currencies. Note that GCC interest rates can consequently be characterized as being cointegrated with respect to the Fed Funds Rate (Bova, 2012).

by the statistical authorities has generally not been adjusted for seasonality. Thus, we performed all necessary normalizations to remain in line with the literature on fiscal multipliers.

To rid the data of seasonal variation, we normalized the data with the help of the X13-ARIMA-SEATS routine provided by the US Census Bureau when significant seasonal factors were found to be present, as determined by the Kruskal-Wallis test. Thereafter, all relevant nominal variables were deflated using the 2018Q4 GDP deflator and, where necessary, converted into USD equivalents using the prevailing exchange rate. Since the stated goal is to assess the ability of fiscal policy to stabilize business cycles, the trend of the real output measure is estimated with a fourth-degree polynomial. This trend is then used to calculate the country-specific deviation of measured output from trend – a 'cyclical output gap'. The fiscal multiplier estimates measure the effects of fiscal policy on this output gap quantity, following Gordon and Krenn (2010). We therefore effectively focus in great detail on the ability of fiscal policy to influence cyclical fluctuations in output, which is generally among the principal goals of stabilizing fiscal policy. Alternative normalizations, such as by the current flow level of output, do not deliver similarly clear policy messages.

Given our identification assumption, which leverages demand-side fluctuations in the global oil market, we are considering *non-hydrocarbon output* as the outcome variable of interest, as alluded to above. The reason is that hydrocarbon output itself is directly influenced by changes to global hydrocarbon demand, which would tarnish our identification assumption. In addition to enhancing the validity of our approach, we also expect an increase in the power of our results, since quantitatively measurable fiscal policy measures primarily influence the non-hydrocarbon portion of output.

Our sample generally runs from Q1-2010 until Q2-2024, inclusive, yielding a total of at most 58 quarter-county observations. While our per-country sample size is indeed fairly limited, our chosen estimation method nonetheless allows us to provide estimates while limiting concerns related to bias in the estimates. Data for the years prior to 2010 is generally not available. The two notable exceptions are Bahrain and the UAE. Our data sample for the UAE commences in Q1-2011, while our sample for Bahrain begins in Q1-2015.[12] Since the main focus is on real quantities, and not on the concurrent inflationary dynamics, we finally deflate all variables to real terms using the local GDP deflator.

4 Results

We now discuss our headline estimates of fiscal multipliers. Following our data normalization discussed in section 3, the fiscal multipliers provided here factually evaluate the ability of fiscal policy to provide buffers in terms of influencing cyclical fluctuations of real non-hydrocarbon output from trend, in line with the literature standard.

[12] While official data on quarterly fiscal policy and output for the years 2010-2014 is available for Bahrain, the quarter-on-quarter variation of fiscal variables in the data is minimal. This impedes the estimation of the effects of fiscal policy. The data on Bahrain in the years 2010-2014 is therefore excluded from the analysis.

4.1 Country-specific fiscal expenditure multipliers

We begin by analyzing the dynamic effects of *headline fiscal expenditures* on *non-hydrocarbon output*; that is, we evaluate the dynamic effect of a one unit change in government expenditures to the cyclical component of output in the short-run. Figure 1 provides the results.

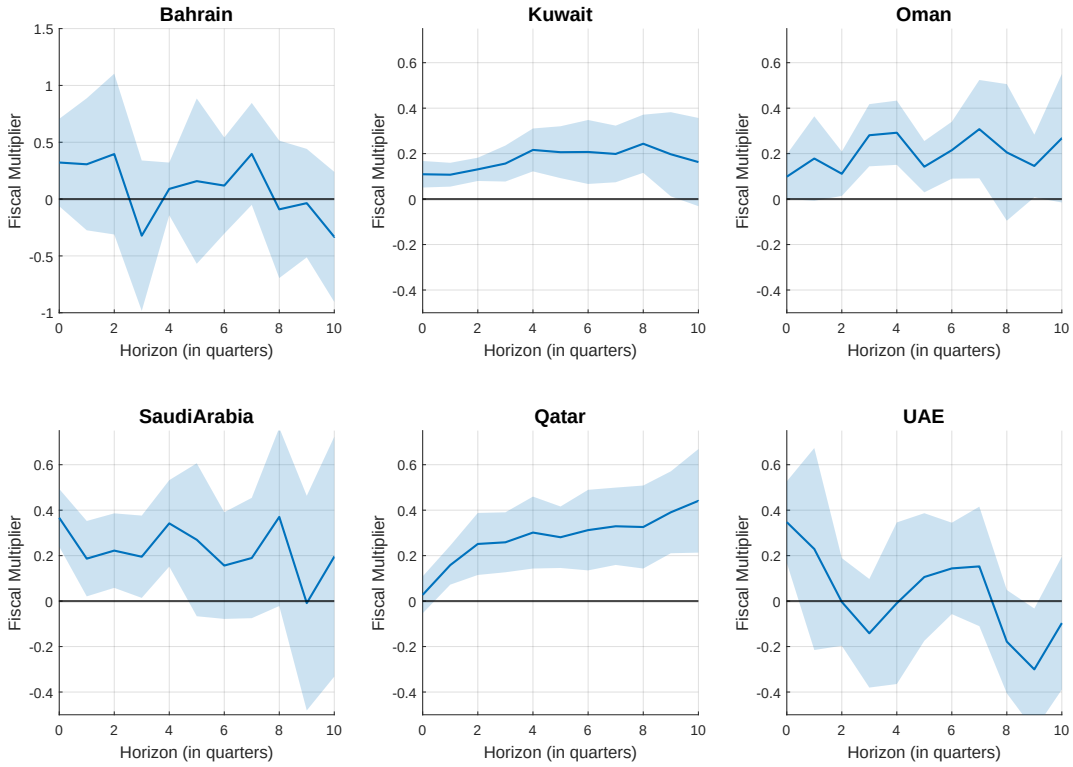

Figure 1: Fiscal multipliers retrieved from a Local Projection following equation (LP-IV), with government expenditures being instrumented by a combination of a Blanchard and Perotti (2002)-style instrument and the oil demand shock components of Baumeister and Hamilton (2019). Shaded areas represent 90% confidence intervals around the fiscal multiplier estimates.

The quantities depicted in figure 1 measure the cumulative response of output from period 0 until the period depicted (in units) for a cumulative one unit fiscal impulse. Government expenditures have been instrumented in line with the discussion in sections 2 and 3. There is broadly a significantly positive effect of government expenditure on output across the board. This reinforces the idea that fiscal policy in the GCC can be considered effective at combating cyclical variation in non-hydrocarbon output. In terms of instrument validity, the Sargan-Hansen test robustly fails to reject the null hypothesis at the impact horizons under consideration, with p-values generally ranging between 0.15 and 0.8. Taking Saudi Arabia as an example, the Sargan-Hansen test values are 0.6732 on impact of the fiscal impulse, 0.8453 in the first quarter after the identified fiscal impulse, and 0.6218 two quarters after the fiscal impulse. We therefore consider the exclusion restriction as likely to be satisfied.[13] The patterns of fiscal multipliers, however, are different across the GCC member countries and warrant further discussion.

[13] Detailed test statistics for all countries can be found in appendix table A.1.

In Bahrain, we find the present-value fiscal multiplier point estimate to be among the highest in the GCC on impact. In the initial period, a 1 unit change in government expenditure leads to a 0.35 unit change in non-hydrocarbon output. This is firmly placed within the range of estimates commonplace in the literature on fiscal multipliers estimated with state-of-the-art econometric methods. However, given the short sample size, the estimate is uncertain and not statistically significantly different from zero at conventional significance levels. Following the impulse period, the fiscal multiplier generally remains insignificant in the estimation, with the point estimates varying between values slightly above and slightly below zero.

For Kuwait, we establish that a 1 unit change in government expenditure is associated with an impact change in non-hydrocarbon output of 0.11 units. Subsequently, the effect of the fiscal impulse on output is increasing, with a maximum estimate of the present-value multiplier around 0.23 eight quarters after the initial fiscal impulse. This is in line with existing literature estimates for other small open economies under fixed exchange rates (Ilzetzki et al., 2013). The estimates for Kuwait are furthermore broadly statistically significant until 10 quarters after the initial impulse, which is far from trivial given the limited sample size.

Our multiplier estimates are also broadly positive in Oman, but the exact magnitude with which fiscal policy influences non-hydrocarbon output dynamics is arguably varying over time following the initial impulse. In the period of the fiscal impulse, the non-hydrocarbon output response to the fiscal expenditure impulse is barely significantly different from zero. But in Oman, too, present-value fiscal multipliers initially grow after the fiscal impulse period, peaking locally at around 0.3 one year after the initial fiscal impulse. At that point, the estimated fiscal multiplier is statistically significantly different from zero at conventional confidence levels.

Estimated fiscal multipliers in Qatar indicate a generally significant response of non-hydrocarbon output in response to expansionary fiscal shocks. For Qatar, a maximum cumulative fiscal multiplier on expenditures of 0.43 occurs after 10 quarters, meaning that an initial 1 unit fiscal expenditure shock causally relates to a cumulative output increase of 0.43 units over the subsequent 2.5 years.

Saudi Arabia displays robustly positive fiscal multipliers in response to changes in fiscal expenditures. The estimates in the initial four quarters following the fiscal expenditure impulse display significant changes in non-hydrocarbon output, with the present-value multiplier achieving a local maximum at almost 0.4 units both on impact as well as one year after the fiscal impulse. Subsequent fiscal multiplier estimates for up to 12 quarters after the initial shock remain positive but are statistically insignificant.

The UAE is broadly speaking an outlier in our estimation. While the multiplier on fiscal expenditure is decidedly positive in the period of the fiscal impulse, lying at around 0.34, it becomes insignificant after one quarter. This implies that no statistically significant change in cumulative non-hydrocarbon output following the fiscal expenditure impulse can be found. The estimate of the effects of this fiscal policy on output remains insignificant, with point estimates becoming occa-

sionally negative. While this may at first seem surprising, it is broadly in line with the literature that finds the possibility of non-positive effects of fiscal expansions when private activity is crowded out to a very large degree.

To sum up, fiscal multipliers are generally positive across the board in the GCC, although they are at the same time significantly less than 1. We re-iterate that the results on the country-level must be appreciated with some caution due to the limited sample size and our choice of local projections as the econometric method of choice, which in combination yield relatively wide confidence bands (Montiel Olea et al., 2025).

The results imply that fiscal policy in the GCC is overall effective at providing cyclical stabilization to non-hydrocarbon output dynamics. There is, however, no "multiplying effect" from fiscal expenditures in terms of its impact on business cycle stabilization. The estimates can be considered at the lower end of what is conventionally found for other countries. One possible cause of this, following Čapek et al. (2022), might be that we use headline aggregate fiscal expenditures: as figure 4 of Čapek et al. (2022) shows, using such gross expenditures leads to fiscal multiplier estimates at the lower end relative to the careful analysis of individual fiscal instruments of choice. Due to the lack of publicly available suitable data, however, we are not able to remedy this issue.[14]

4.2 Multipliers to variables other than headline fiscal expenditures

Headline fiscal expenditures are - not without reason - the natural first fiscal instrument to consider when assessing the scope to which fiscal policy is able to influence local economic conditions. Nonetheless, income-side fiscal policy measures remain important to the successful pursuit of business cycle stabilization. So far, the chosen measure of fiscal expenditure was instrumented by unexpected shifts to global hydrocarbon demand, altering present fiscal constraints. Considering instead fiscal income as the instrumented policy instrument of choice is principally plausible.

Therefore, we repeat the estimation process characterized in equation (LP-IV), but instrumenting headline fiscal income in place of headline fiscal expenditures. Relative to the government expenditure estimates, the income-side estimates are a little more difficult to rationalize given our identification assumptions. The income-side multipliers presented here can be considered proxies for absolute fiscal capacity, which may or may not be materialized through higher expenditures. In contrast, the multiplier estimates on government expenditures directly provide fiscal multiplier estimates for situations in which a surprise change in global hydrocarbon demand leads to changes in domestic non-hydrocarbon output *through* changes to fiscal expenditures. Thus, the expenditure-side multipliers are estimates rooted in factual fiscal expenditures, whereas the estimates provided here relate in a sense to potential expenditures.

[14] In appendix C we provide further details on the aggregate composition of government budgets in relation to our data constraints.

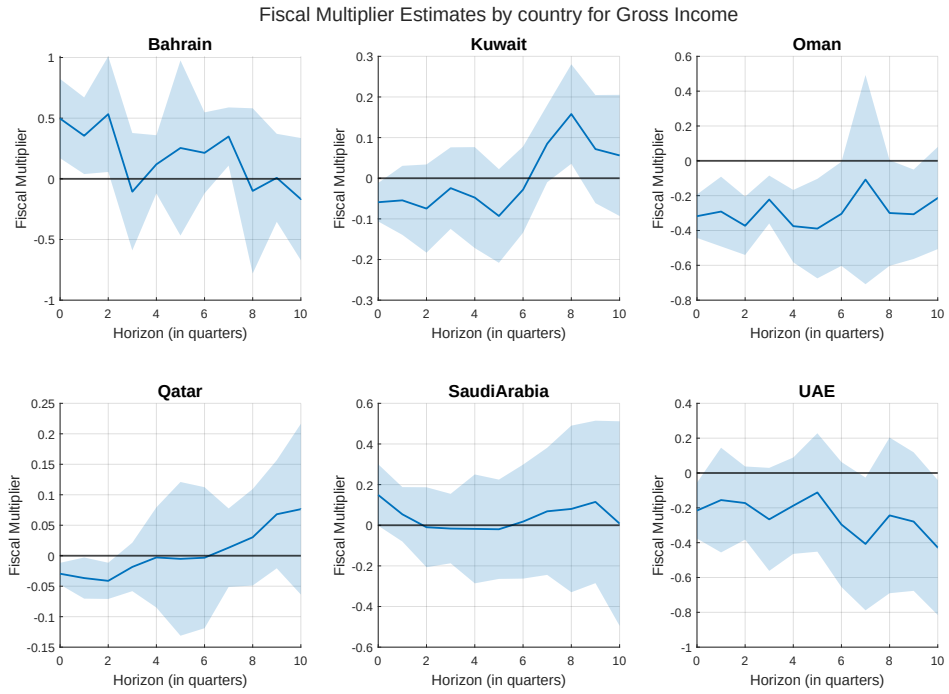

Figure 2: Fiscal multipliers retrieved from a Local Projection following equation (LP-IV), but with headline *government income* being the fiscal impulse of interest, instrumented by a combination of a Blanchard and Perotti (2002)-style instrument and the oil demand shock components of Baumeister and Hamilton (2019). Shaded areas represent 90% confidence intervals around the fiscal multiplier estimates.

Figure 2 shows the main estimates of interest on the income side, capturing the cumulative effects of changes in fiscal income on non-hydrocarbon output in GCC economies. The results here are decidedly less clear than in the case of fiscal expenditures. Unlike fiscal expenditures, there is no clear statistically significant positive relationship between fiscal income and non-hydrocarbon output.

Bahrain displays the most significant response across the GCC in general, with significantly positive fiscal income multipliers of around 0.5 when a fiscal impulse is observed. A measured 1 unit increase in fiscal income therefore relates to a 0.5 unit increase in the preferred output measure. Over time, the cumulative multipliers decrease to being slightly negative three quarters after the impulse, and the estimates are generally statistically insignificant outside of the initial few periods.

Kuwait and Qatar display quite similar patterns, with fiscal multipliers on fiscal income being marginally below zero initially. Subsequently, the multipliers are increasing to above zero around two years after the fiscal impulse. These estimates point at a gradual relationship between fiscal income and rebounds to cyclical fluctuations in non-hydrocarbon output, albeit in a quantitatively very limited sense.

Oman and the UAE make up another group of countries displaying similar patterns. Income-side multipliers are generally below zero from the onset of the fiscal impulse for the first three years after that impulse. In the case of Oman, the multiplier estimates are even significantly negative, hinting at the possibility of a decrease of 0.3 units in non-hydrocarbon GDP around one year after

a 1 unit shock to fiscal income.

Finally, Saudi Arabia's income-side fiscal policy as measured through fiscal multipliers appears to have barely any effect on non-hydrocarbon output, being broadly insignificant except for a small positive fiscal multiplier in the period of the initial impulse of around 0.17.

The bottom line of this exercise is that the effects of fiscal income on non-hydrocarbon output are not as clear as for fiscal expenditures. In particular, common literature estimates on income multipliers frequently specify *tax* multipliers, which are commonly expected to be negative: surprise tax hikes usually crowd out private sector activity, leading to negative fiscal multiplier estimates on government income. This crowding out can be either through a reduction of disposable income leading to decreased private consumption, or through diminished private-sector investment due to possible investments turning NPV-negative.

The context of the GCC is vastly different. Most of the fiscal income raised in the GCC is rooted in *hydrocarbon sales*, and our instruments are plausible predictors for surprise changes to such income in particular. Thus, our income-side multiplier estimates are unlikely to be driven by a crowding-out of private activity, since changes to domestic private sector behavior have little effect on gross fiscal income.[15] Nonetheless, the estimates provided here might conflate the possibly positive effects of higher hydrocarbon sale income with the possibly negative effects of changes in taxation.[16] From a policy perspective, income-side policy does not appear to meaningfully influence cyclical non-hydrocarbon output in the GCC. In terms of macroeconomic stabilization of the non-hydrocarbon environment, the message is that changes to fiscal income do not perpetuate directly to output dynamics. Instead, once such changes to income are passed through to fiscal expenditures, output-stabilizing motives of fiscal policy can be attained.

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The previous exercises and analyses were constrained by the limitations caused by the short sample size of at most 58 quarter-year observations for the six GCC economies. However, more in-depth questions related to fiscal multipliers in the GCC are of obvious importance, such as state-dependence or the consideration of more specific parts of fiscal income or expenditures. To answer such questions, we now undertake steps to bolster the statistical power of our estimation exercise.

We therefore now move on to analyzing the efficacy of more granular fiscal instruments (to the

[15] Since the non-oil revenues are furthermore mostly VAT/sales within the context of the GCC, any non-oil fiscal income estimates are likely relatively cyclical by nature.

[16] Given the nature of fiscal income in the GCC, what we observe here is unlikely to be considered fiscal policy in the sense of taxation policy and its conduciveness to business cycle stabilization, which is the usual rationalization through which fiscal income policy influences cyclical fluctuations in output. Here, given the narrow tax base and our leveraging of hydrocarbon demand shocks to identify truly exogenous variation, we basically measure the direct effects of fiscal space on non-hydrocarbon output. In that sense, while the first-stage of the estimation likely benefits from considering fiscal income, the second-stage of our analysis is less likely to showcase meaningful effects, as we basically observe the effects of hydrocarbon demand shocks on *potential* fiscal expenditures here. In any case, what we measure here is completely unrelated to the standard story of tax hikes cooling down the business cycle. Our story appears to be generally confirmed as we generally do not observe significantly negative multipliers when looking at the effects of fiscal income on non-hydrocarbon output, which is the usual direction observed.

degree possible) on the *aggregate* GCC level. The country-level data used before is now pooled and used in a single estimation with time-invariant country-specific fixed effects. The one very simple advantage is the increase in statistical power by pooling all GCC economies for which data is available.[17] With that increase in statistical power, it is possible to consider the effects of specific fiscal sub-instruments, such as investment (capital spending) or day-to-day spending (current spending), on the output measure.

In terms of the econometrics, we simply pool all countries together without country-specific weighting. We then estimate a version of equation (LP-IV) which accounts in addition for a country-specific fixed effect, absorbing any elements inherent to time-invariant country-level mechanisms.

This additional exercise therefore considers the ability of individual fiscal instruments to provide the short-sun stabilization desired of fiscal policy. To that end, fiscal *expenditures* are separated into capital spending and current spending, and fiscal *income* is separated into hydrocarbon income and other (non-hydrocarbon).

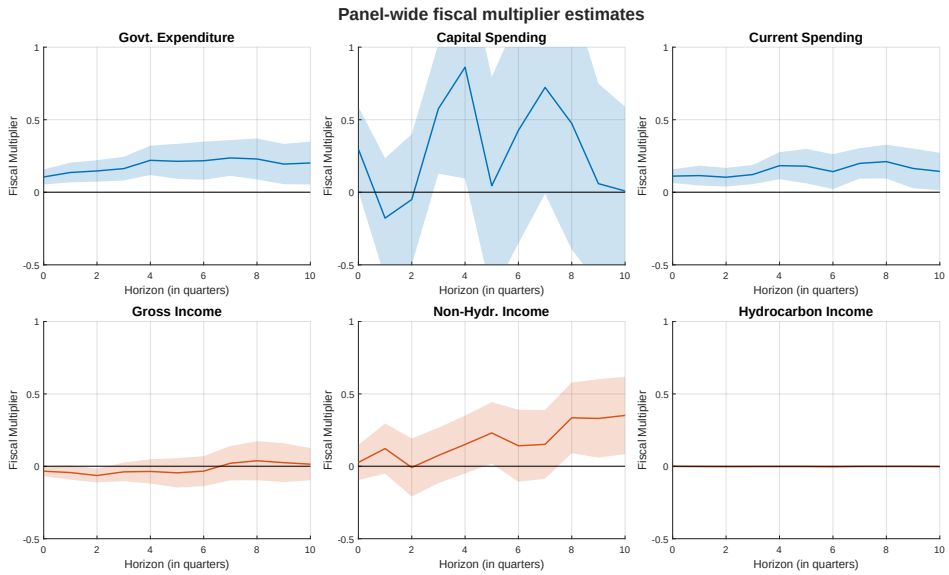

Figure 3: Pooled local projection results for aggregate fiscal expenditures, aggregate fiscal income, and specific sub-categories of each of them in the GCC, following the specification in equation (LP-IV), but with an additional country-level fixed-effect.

Figure 3 presents the headline fiscal multiplier estimates in an estimation for the entire panel of GCC economies for each fiscal instrument considered. The results are generally reassuring and confirm the previous findings, although the point estimates are slightly lower. Leveraging the statistical power of the GCC-wide panel dataset, gross government expenditure (top left panel) displays significant and persistent multipliers of around 0.1-0.25 from the initial period until three years after the expenditure impulse, meaning that a 1 unit change in fiscal expenditures in the GCC

[17]For Bahrain, Saudi Arabia, and the UAE, complete data on all variables is available. For Kuwait and Oman, there are only limited data samples for the individual fiscal instruments spanning at most 5 years; and for Qatar, there exists only data on aggregate income and expenditures, but nothing specific on specific income or expenditure instruments. Figure C.1 in the appendix provides this decomposition for the year 2023.

translates to a 0.1-0.25 unit change of non-hydrocarbon GDP on average. This change persists well into the medium term, as the fiscal multipliers remain significantly positive 10 quarters after the initial impulse.

This change in non-hydrocarbon output can be associated with changes in the government current spending component of total government expenditures. The multiplier estimates capturing the effect of current spending on non-hydrocarbon output are qualitatively and quantitatively very similar to the effects of total government expenditure. As for capital spending, no plausible significant effect of such capital spending on cyclical fluctuations in non-hydrocarbon GDP is found. This should not come as a surprise, since the positive effects of capital spending can take years, or even decades, to materialize fully. Such government capital spending mostly influences potential output, not its cyclical variation. In addition, public capital spending in the GCC countries is also conducted through Sovereign Wealth Funds (SWFs) and State-Owned Enterprises (SOEs), which are not fully captured by consolidated government expenditure statistics. Omitting these elements might bias our multiplier estimates downwards. However, obtaining publicly available quantitative data on SWFs and SOEs that can be integrated with quarterly government expenditure statistics is not feasible.

The estimates of the effects of government income (depicted in the bottom row) also confirm the previous findings. In particular, changes to sovereign income are generally statistically insignificant, except for a brief period two quarters after the initial fiscal impulse with a negative government income multiplier of -0.08. Changes to government income themselves do not seem to be related to subsequent positive changes in non-hydrocarbon output.

Splitting government income up into non-hydrocarbon and hydrocarbon-related income confirms the robustness of the estimation methodology. The estimated multipliers are mainly driven by changes to tax (and other non-hydrocarbon) income, which are generally insignificant and centered around zero. Zooming into hydrocarbon income, multiplier estimates are orders of magnitude smaller, being effectively zero. This is a direct consequence of the estimation approach: because the estimation leverages exogenous changes to hydrocarbon demand as instruments for changes in the government income variable of interest, virtually all variation in that fiscal measure coming from the shocks is absorbed by the first-stage estimation. Additionally, as the output measure concerns non-hydrocarbon output, hydrocarbon income is exempt from the output measure in an accounting sense.

4.3 The state-dependence of fiscal multipliers

Local projections offer the advantage that they allow the direct calculation of *state-dependent fiscal multipliers*, which would be more tedious under estimation methods leveraging additional cross-equation restrictions, given our limited sample size. More importantly, when estimating a form of state-dependence in VARs, the estimation can bear the inherent assumption that the economy will remain in the state at which the VAR is estimated. For cases of interest in the fiscal context, such as

the presence of expansions/contractions against the backdrop of any chosen fiscal policy measure, this is not a tenable assumption.

We make use of the benign properties of our estimation method, attempting to evaluate more directly the efficacy of fiscal policy in the GCC during recessions. Following our previous results, we focus here on headline government expenditures. Since a certain degree of statistical power and sampling variation is needed to obtain state-dependent estimates, which is barely feasible at our sample length when considering each economy on its own, we pool all countries together (given their broad similarities in terms of their economic structure and their partial dependence on hydrocarbon generation), and leverage the additional cross-country variation to pin down whether fiscal multipliers are larger in recessions or in expansions.

The specification of the local projection equation relevant for this context is the following:

$$y_{c,t+h} - y_{c,t-1} = \alpha_{ch} + \beta_h \Delta \hat{g}_{ct} + \sum_{l=1}^{L} \Big(\gamma_{1h}(y_{c,t-l} - y_{c,t-l-1}) + \gamma_{2h}(g_{c,t-l} - g_{c,t-l-1}) + \gamma_{3h}(t_{c,t-l} - t_{c,t-l-1}) \Big) + ti + \Gamma_c + u_{c,t+h}, \qquad \forall h \in \{0, ..., 12\}, R = \{0, 1\} \qquad \text{(LP-IV-SD)}$$

$$\Delta g_{c,t} = a + \delta_1 BP_{c,t} + \delta_2 BH^1_{c,t} + \delta_3 BH^2_{c,t} + \varepsilon_{c,t}, \quad \forall R = \{0, 1\}. \qquad \text{(Instrumenting equation)}$$

where R is a binary recession indicator, where recessions are specified as following negative quarter-on-quarter real GDP growth rates, the lowercase c indexes each individual country, and Γ_c are country-level fixed effects. In terms of the instrument construction, note that the exogenously supplied shock elements from Baumeister and Hamilton (2019) are necessarily equal across countries, but additional variation is provided by the Blanchard-Perotti style instrument that is also used in the above IV specification. To facilitate correct inference in the panel context, we adjust the standard error construction for heteroskedasticity and autocorrelation-robustness using the method of Driscoll and Kraay (1998).

Figure 4 provides the main result of this exercise. The blue line depicts the fiscal multiplier as estimated following equation (LP-IV-SD) when a given country enjoys an economic expansion, while the red line depicts the fiscal multiplier for recessionary periods.

The results are very stark: the fiscal multiplier is *not* significantly different from zero in periods of economic expansion; that is, when non-hydrocarbon GDP growth is positive, output cannot be boosted significantly through a fiscal expansion. When a country is in a recessionary period, however, we can observe significantly positive present-value fiscal multipliers, peaking at about 0.3 five quarters after the initial fiscal impulse, and remaining significantly above zero for up to three years. Thus, a 1 unit increase in fiscal expenditure increases non-hydrocarbon output by 0.3 units over five quarters when that fiscal impulse is sent in a recession. Therefore, proactive fiscal policy aiming at cyclical stabilization of non-hydrocarbon output is effective during recessions. However,

expenditure-side fiscal policy does not yield expansionary outcomes when the economy is outside of a recession.

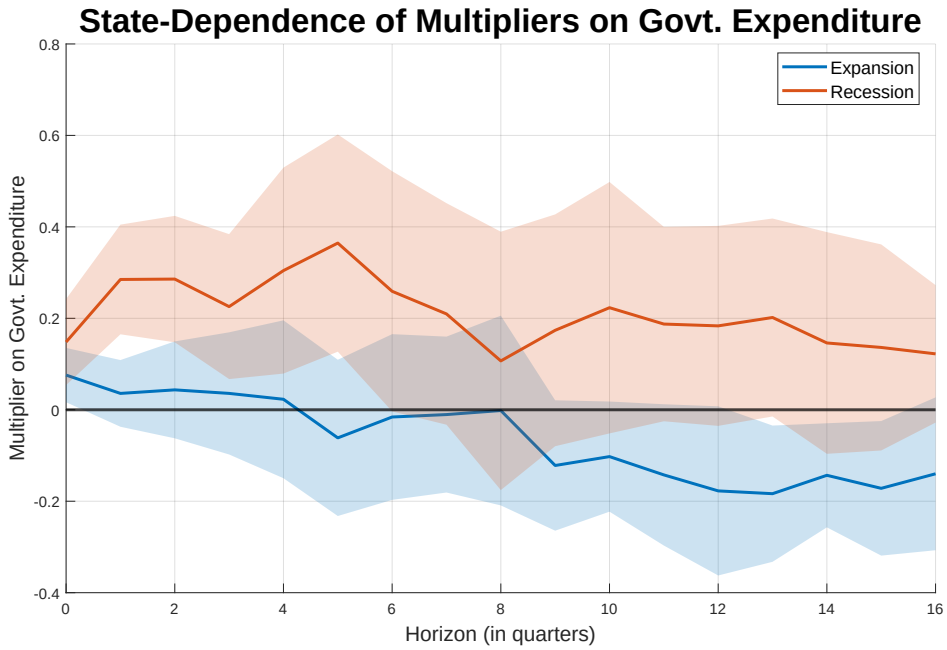

Figure 4: Evidence on the state-dependence of fiscal multipliers in the GCC economies following our specification of state-dependent panel local projections in equation (LP-IV-SD). Shaded areas represent 90% confidence intervals.

5 Conclusion

This paper provided estimates of fiscal multipliers across broad classes of policy instruments in the member countries of the Gulf Cooperation Council (GCC). We view this exercise as informative, since the unique nature of fiscal income dynamics in the GCC allows for a relatively clear identification of exogenous shocks to fiscal capacity by leveraging exogenous changes to hydrocarbon demand, which in turn provide variation in local fiscal budgets across the GCC.

Despite prevailing sample size limitations, we provided fiscal multiplier estimates for all individual GCC members and across the whole GCC together. The main policy tool of interest are short-term fiscal expenditures, which we relate to subsequent changes in non-hydrocarbon output. The multiplier estimates both for individual countries and for the entire GCC range between 0.1 and 0.4 one year after the impulse. This indicates that a 1 unit change in government expenditures can be generally related to a 0.1-0.4 unit change in output. The only outliers are Bahrain and the UAE, for whom no significant positive effects one year after the impulse can be found. In both instances, however, data limitations might have hampered the estimation more than for the other four GCC economies. While the effect for fiscal expenditures is generally positive and significant, little to no effects are found for changes to fiscal income.

In terms of policy messages, our results reinforce the perspective that fiscal expenditures are not a panacea to influence economic activity, but when deployed in the right circumstances, they are a

powerful economic tool. Considering first the role of fiscal policy for cyclical output stabilization, the estimates indicate generally positive fiscal multipliers for government expenditures in the GCC and in most member countries. The estimates are generally larger during economic downturns, such that fiscal policy is more effective at influencing output during times of economic dearth in the GCC. Even in such cases, however, fiscal expenditure multipliers are generally significantly below one, indicating that the overall impact of fiscal policy is significant, but modest. A more granular analysis of individual fiscal instruments might enhance the results and provide more significant estimates, as an instrument-level analysis more effectively controls for automatic stabilizers ingrained in fiscal expenditures.

Despite the relative robustness of the results thanks to the use of state-of-the-art econometric methods, the provision of longer-run data will be one of the first steps that must be considered in the future to improve the present estimates. While the use of modern econometric methods allows the sidelining of a number of concerns present in the literature previously, the lack of data from the pre-2010 period hinders the ability to attain results with a very high degree of precision. An additional verification of the exogenous variation utilized here through a narrative account would further enhance the validity of the presented estimates. Both of these suggestions would further benefit from more granular data, especially instrument-level data in quarterly frequency. Such data would allow interested researchers and policymakers the consideration and evaluation of specific policy tool, controlling for in-built automatic stabilizers within the conduct of fiscal policy. Finally, supplementing the empirical analysis presented here with a model-based evaluation of fiscal multipliers is a further useful step to rationalize the mechanisms shaping fiscal multipliers.

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Appendix

A Appendix A. Further figures and tables

Here, we supplement our headline results from section 4 with figures and tables that underline the validity of the instruments used in our estimation, as well as of the relatively benign size of the IV estimation bias when taking our limited sample size into account.

Country	Horizon	Forecast	SE	F-Val.	Sargan p-val.
Bahrain	0	0.3216	0.2345	2572.83	0.5316
Bahrain	1	0.3062	0.3542	1214.13	0.6778
Bahrain	2	0.3959	0.4313	2683.20	0.7250
Bahrain	4	0.0896	0.1413	2329.39	0.6106
Bahrain	8	−0.0902	0.3686	334.71	0.2375
Kuwait	0	0.1092	0.0356	100.03	0.3262
Kuwait	1	0.1072	0.0320	98.45	0.3097
Kuwait	2	0.1309	0.0312	78.10	0.3114
Kuwait	4	0.2162	0.0575	81.39	0.6734
Kuwait	8	0.2435	0.0780	46.81	0.3284
Oman	0	0.0985	0.0599	143.64	0.1675
Oman	1	0.1784	0.1133	275.97	0.2251
Oman	2	0.1114	0.0596	500.22	0.2168
Oman	4	0.2919	0.0862	466.30	0.2245
Oman	8	0.2053	0.1832	166.71	0.7410
Qatar	0	0.0275	0.0496	34.42	0.3866
Qatar	1	0.1583	0.0524	42.70	0.2796
Qatar	2	0.2514	0.0832	47.86	0.2648
Qatar	4	0.3015	0.0965	102.53	0.5025
Qatar	8	0.3259	0.1114	99.31	0.7471
Saudi Arabia	0	0.3664	0.0775	275.40	0.6732
Saudi Arabia	1	0.1867	0.1011	313.39	0.8453
Saudi Arabia	2	0.2221	0.0999	379.11	0.6218
Saudi Arabia	4	0.3420	0.1160	430.91	0.4300
Saudi Arabia	8	0.3703	0.2391	397.45	0.8212
UAE	0	0.3473	0.1095	2002.79	0.1802
UAE	1	0.2291	0.2710	1722.04	0.1352
UAE	2	−0.0036	0.1176	1924.34	0.2376
UAE	4	−0.0093	0.2167	3075.35	0.2391
UAE	8	−0.1784	0.1386	8689.87	0.8028

Table A.1: Multiplier estimates and test results underpinning figure 1

Table A.1 provides additional information on the fiscal multiplier estimates obtained using the one-step local projection approach favored by Ramey and Zubairy (2018). The estimates and standard errors correspond to the values depicted in figure 1. The depicted F-values in the fourth column concern the first-stage of the estimation, broadly reflecting the significance of the instrumenting regression.[18] Reassuringly, the instruments appear to be highly significant across the board. The lowest significance of the first-stage regression can be observed in Qatar, which is not too surprising since Qatar depends majorly on the export of gas, whereas our instrumenting approach is particularly well-suited for oil exporters. Nonetheless, all depicted F-statistics indicate that our chosen instruments are broadly relevant, exceeding the critical values advocated by Stock and Yogo (2005) at conventional levels. Finally, the sixth column of the table presents the p-values of the Sargan-Hansen test of overidentifying restrictions. As the null hypothesis underpinning the test generally isn't rejected, we can generally consider the instruments to satisfy the necessary exclusion restriction.

Tables A.2 and A.3 supplement the above results, summarizing the findings on the estimated multipliers for both gross fiscal income in the individual GCC economies and for the wider set of fiscal instruments considered in the panel setting. In terms of the validity of our proposed identification, the results on income multipliers broadly mirror our findings for the expenditure multipliers. In the panel setting depicted by table A.3, however, the Sargan-Hansen test indicates some potential restrictions of our identifying assumption, especially at short horizons.

Country	Horizon	Forecast	SE	F-Val.	Sargan p-val.
Bahrain	0	0.4968	0.1992	2115.25	0.4891
Bahrain	1	0.3552	0.1927	2370.50	0.5861
Bahrain	2	0.5332	0.2907	2679.45	0.6734
Bahrain	4	0.1195	0.1463	2564.34	0.6363
Bahrain	8	−0.0994	0.4152	453.15	0.2556
Kuwait	0	−0.0590	0.0289	350.17	0.3271
Kuwait	1	−0.0544	0.0518	353.42	0.2214
Kuwait	2	−0.0747	0.0662	92.60	0.1325
Kuwait	4	−0.0476	0.0757	324.93	0.8441
Kuwait	8	0.1580	0.0747	309.86	0.6065
Oman	0	−0.3179	0.0762	161.86	0.2421
Oman	1	−0.2914	0.1221	131.10	0.1786
Oman	2	−0.3729	0.1021	163.38	0.2211
Oman	4	−0.3751	0.1268	102.16	0.1402
Oman	8	−0.2997	0.1849	128.30	0.7879
Qatar	0	−0.0295	0.0109	16.51	0.2998
Qatar	1	−0.0367	0.0206	19.82	0.1843

[18] Appendix D further details the first-stage results.

Qatar	2	−0.0412	0.0181	21.78	0.1984
Qatar	4	−0.0028	0.0501	13.66	0.5623
Qatar	8	0.0303	0.0483	28.65	0.7380
Saudi Arabia	0	0.1490	0.0922	60.47	0.6084
Saudi Arabia	1	0.0538	0.0817	93.52	0.6895
Saudi Arabia	2	−0.0098	0.1200	62.43	0.6909
Saudi Arabia	4	−0.0180	0.1634	72.43	0.3449
Saudi Arabia	8	0.0803	0.2500	59.48	0.9290
UAE	0	−0.2158	0.0980	398.34	0.2219
UAE	1	−0.1554	0.1834	167.59	0.2168
UAE	2	−0.1726	0.1281	121.58	0.3356
UAE	4	−0.1877	0.1688	168.00	0.2837
UAE	8	−0.2434	0.2725	167.10	0.6149

Table A.2: Multiplier estimates and test results underpinning figure 2

Variable	Horizon	Forecast	SE	F-val.	Sargan p-val.
expenditures	0	0.1055	0.0317	165.18	0.0418
expenditures	1	0.1363	0.0415	169.34	0.0484
expenditures	2	0.1471	0.0451	152.94	0.0472
expenditures	4	0.2201	0.0617	146.13	0.7059
expenditures	8	0.2294	0.0861	118.16	0.7108
cap_exp	0	0.2971	0.1777	19.65	0.0646
cap_exp	1	−0.1781	0.2518	19.49	0.0446
cap_exp	2	−0.0500	0.2743	19.11	0.0756
cap_exp	4	0.8620	0.4677	19.30	0.4261
cap_exp	8	0.4742	0.5301	20.63	0.7216
curr_exp	0	0.1113	0.0289	54.53	0.0436
curr_exp	1	0.1150	0.0417	54.56	0.0325
curr_exp	2	0.1038	0.0391	51.85	0.0435
curr_exp	4	0.1833	0.0570	51.07	0.5412
curr_exp	8	0.2112	0.0709	48.20	0.8221
income	0	−0.0338	0.0208	57.18	0.0295
income	1	−0.0431	0.0303	60.32	0.0339
income	2	−0.0635	0.0287	62.73	0.0474
income	4	−0.0354	0.0511	56.54	0.5683
income	8	0.0383	0.0824	51.46	0.9023
non-hydr. income	0	0.0267	0.0738	68.84	0.0647
non-hydr. income	1	0.1226	0.1060	66.75	0.0425

non-hydr. income	2	−0.0079	0.1223	63.67	0.1120
non-hydr. income	4	0.1510	0.1215	62.90	0.3435
non-hydr. income	8	0.3349	0.1490	77.84	0.9873
hydr. income	0	−0.0006	0.0011	7.06	0.0717
hydr. income	1	−0.0018	0.0008	8.47	0.1341
hydr. income	2	−0.0025	0.0012	8.79	0.4012
hydr. income	4	−0.0018	0.0018	9.44	0.4977
hydr. income	8	−0.0014	0.0019	10.43	0.6546

Table A.3: Multiplier estimates and test results underpinning figure 3

B Appendix B. Additional robustness checks

Our main specification laid out in section 2 has been confined to a single specific estimate, which was based on a local projection, with the fiscal policy choice variable of interest being instrumented by a combination of a Blanchard and Perotti (2002)-style unexpected fiscal expenditure or income component, and the global hydrocarbon demand shock component recovered by Baumeister and Hamilton (2019).

To prove the relative robustness of the estimates, we now provide a wider set of estimates. In that, we restrict ourselves to analyzing the effects of *headline government expenditures*, which were the main fiscal policy variable of interest in the preceding sections. There will be no evidence presented here on any other fiscal policy variable considered above.

We will work with vector autoregressions and local projections alike, utilizing various combinations of instruments. While we do not report individual results for each of the instruments utilized, we nonetheless intend to provide a general picture confirming the robustness of our headline results.

In terms of the methodological differences, we work with structural vector autoregressions (using a simple Cholesky ordering in a basic three-variable fiscal SVAR, as well as adding additional variables following Perotti (2005) and, finally, instrumenting fiscal expenditures following Blanchard and Perotti (2002)); as well as with the previously discussed LP-IV approach, although we here vary the sets of instruments for headline fiscal expenditures. While in our main specification we used the joint set of an unexpected fiscal expenditure component (á la Blanchard and Perotti (2002)) and the global hydrocarbon demand shock components of Baumeister and Hamilton (2019), we here consider each of these components separately. Additionally, we leverage parts of the oil price supply series of Känzig (2021),[19] as well as the (updated) surprise component to the index of global oil market activity of Kilian (2009). Furthermore, we consider varying lag lengths of the instruments to fiscal expenditures to capture possible lags in the spillovers from the postulated exogenous shock component to materialized fiscal expenditures, in line with a plausible

[19] In our view, given the fact that OPEC decisions themselves are plausibly driven by considerations intrinsic to fiscal budgeting in the GCC, these are more difficult to rationalize as instruments for the estimation of fiscal multipliers.

implementation lag.

Methods	SVAR; LP
Instruments	For SVAR: recursive Cholesky ordering (fiscal impulse of interest sorted first), and recursive ordering with an additional fiscal shock variable (either following Blanchard and Perotti (2002) or recovered through Baumeister and Hamilton (2019)) ordered first; for LP: fiscal impulses á la Blanchard and Perotti (2002) *or* hydrocarbon market surprise components following Kilian (2009), Baumeister and Hamilton (2019), or Känzig (2021) at various lag lengths of up to one year
Controls	Some subset of {CPI inflation, overall debt levels, or lags of fiscal policy variables and the outcome variable of interest}

Table B.1: Modeling variations used in the appendix

Figure B.1 summarizes the unweighted average estimate of the fiscal multiplier on government expenditure in each of the GCC countries up to 8 quarters after the identified impulse. We do not display the SVAR estimates for Bahrain and the UAE, which are generally unreliable. Across the specifications considered (in line with table B.1), our results from section 4 are broadly confirmed, indicating that fiscal multipliers are generally slightly below one. The estimates recovered using SVARs are overall larger, in line with a possible upward estimation bias.

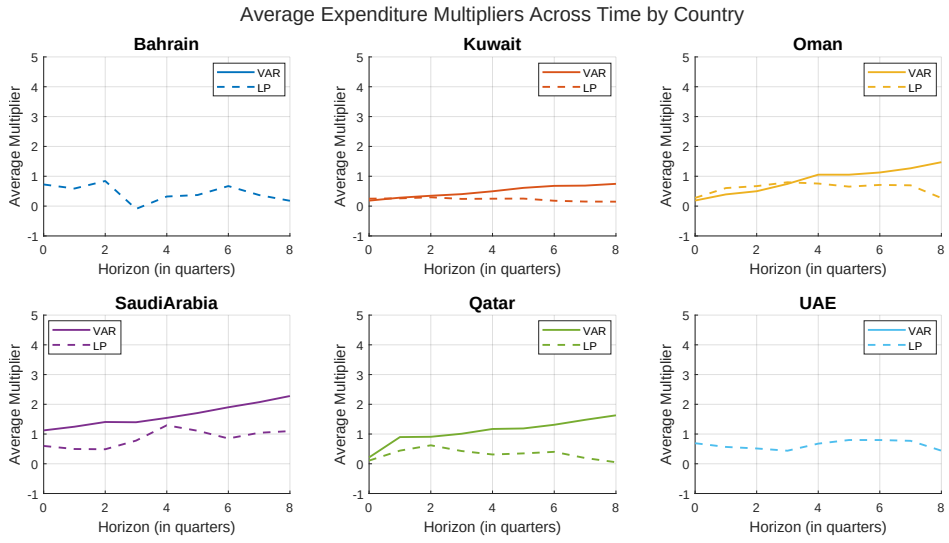

Figure B.1: Overall average fiscal multipliers from all joint specifications, as given by table B.1

Figures B.2 and B.3 provide histograms of the estimated one-year ahead multipliers on fiscal expenditures in each GCC country. In figure B.2, we plot a histogram of all multipliers (although we truncate them at -3 and 5 for better readability) together with an estimated density, whereas figure B.2 separates the estimated multipliers by choice of estimation method. The estimated one-year

ahead multipliers are again generally positive. Our estimates recovered using local projections exhibit less variance, whereas the SVAR estimates are overall more dispersed.

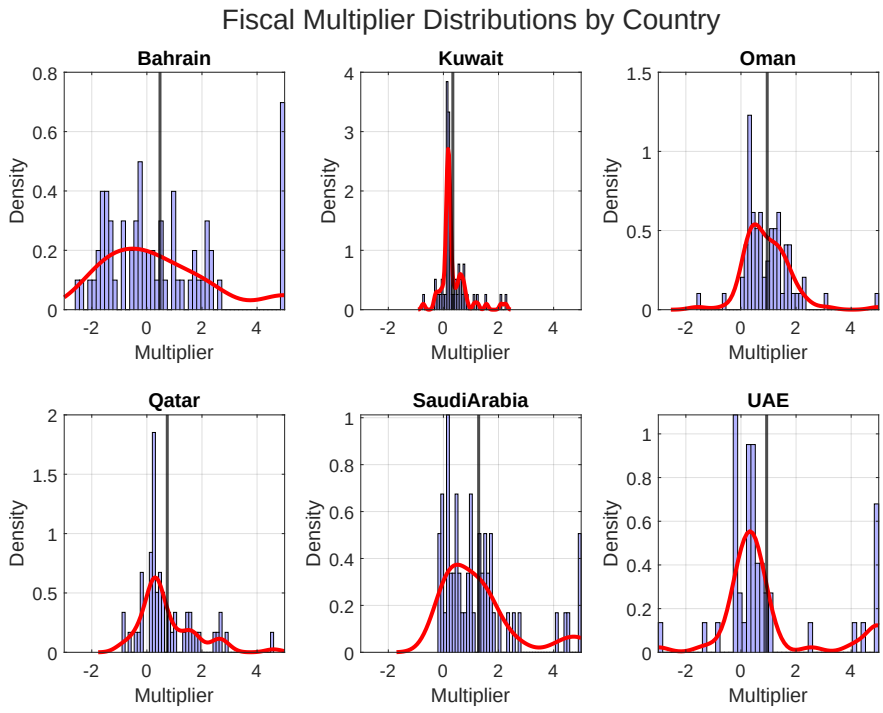

Figure B.2: Distribution of one-year ahead fiscal multipliers on government expenditure.

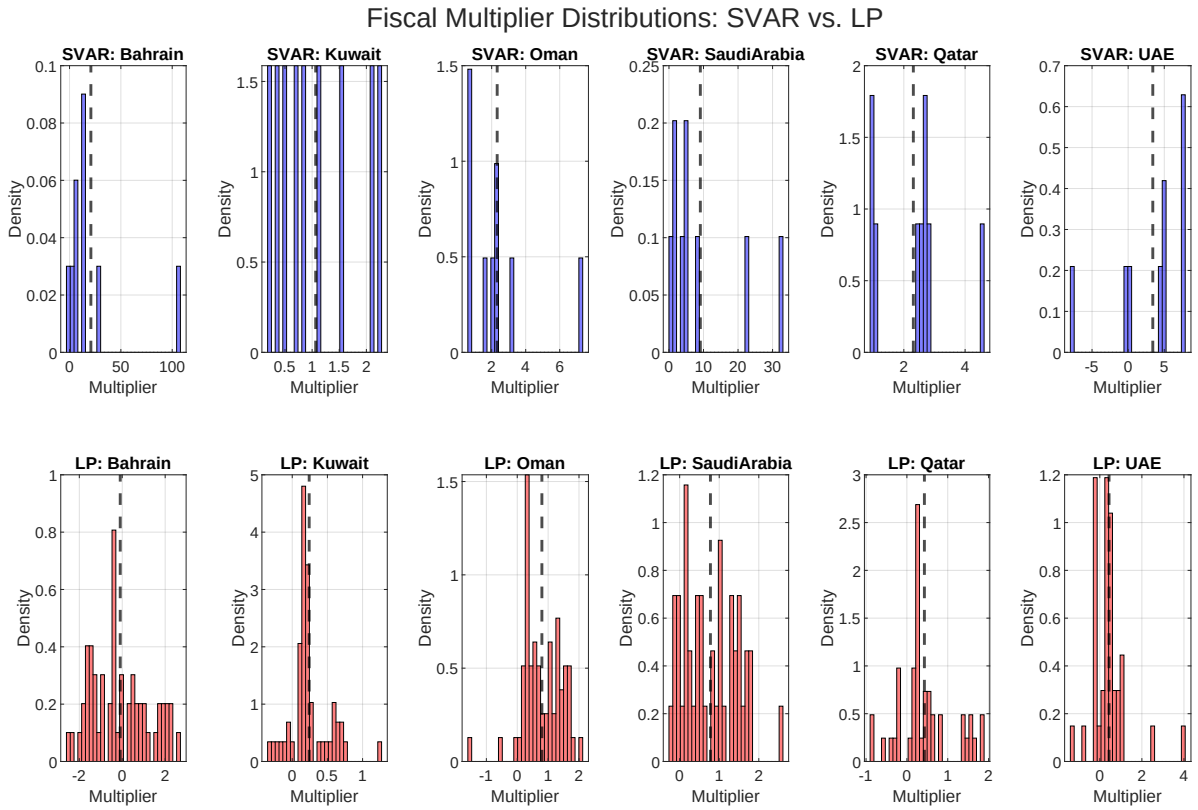

Figure B.3: Distribution of one-year ahead fiscal multipliers on government expenditure - separated by SVAR and LP estimations.

Now, we focus on the LP-IV estimates. Zooming into the dispersion of the LP-IV estimates across time, figure B.4 finally presents the evolution of all recovered local projection estimates for the first 10 quarters after the initial instrumented fiscal expenditure impulse.[20] The red line depicts the median estimate, whereas the gray lines present all other estimates. Whereas there is significant dispersion across all countries, the overall finding of slightly positive multipliers that are generally smaller than 1 is confirmed.

[20] We truncate the y-axis to the interval $[-4, 4]$ to improve the readability of the plot.

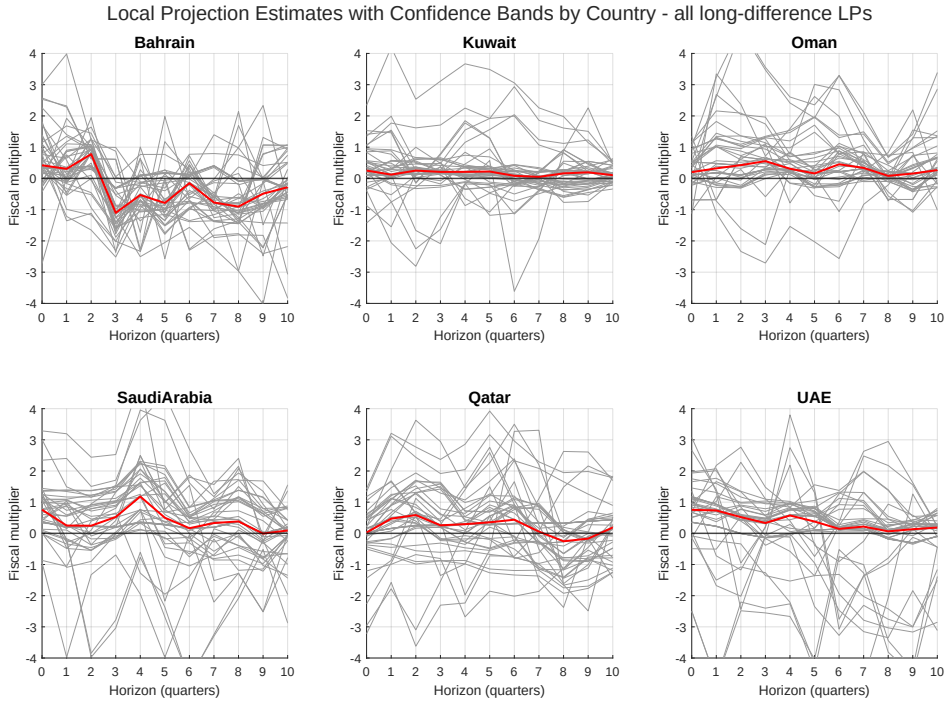

Figure B.4: Estimates of expenditure multipliers recovered using equation (LP-IV) with varying sets of instruments.

Summarized, the main takeaway is that SVAR estimates indeed appear to be relatively unreliable in the face of the constraints faced by our data in terms of overall data quality and sample length. While there are some differences in the results of our local projection depending on its exact specification and depending on the exact way with which fiscal policy variables are instrumented, our estimated multipliers appear to be broadly robust and the headline estimates lie firmly in the middle of potential multiplier estimates on non-hydrocarbon output.

C Appendix C. Additional details on government budgets in the GCC

To provide further context in relation to headline government income and expenditures, we here briefly present a decomposition of the aggregate government budget constraint that is in line with the multiplier estimation by instrument conducted in section 4. Figure C.1 provides this decomposition for the year 2023 for all GCC economies, splitting the income and expenditure sides of the consolidated government budget constraint to the degree that is possible with the quarterly data that we assembled.

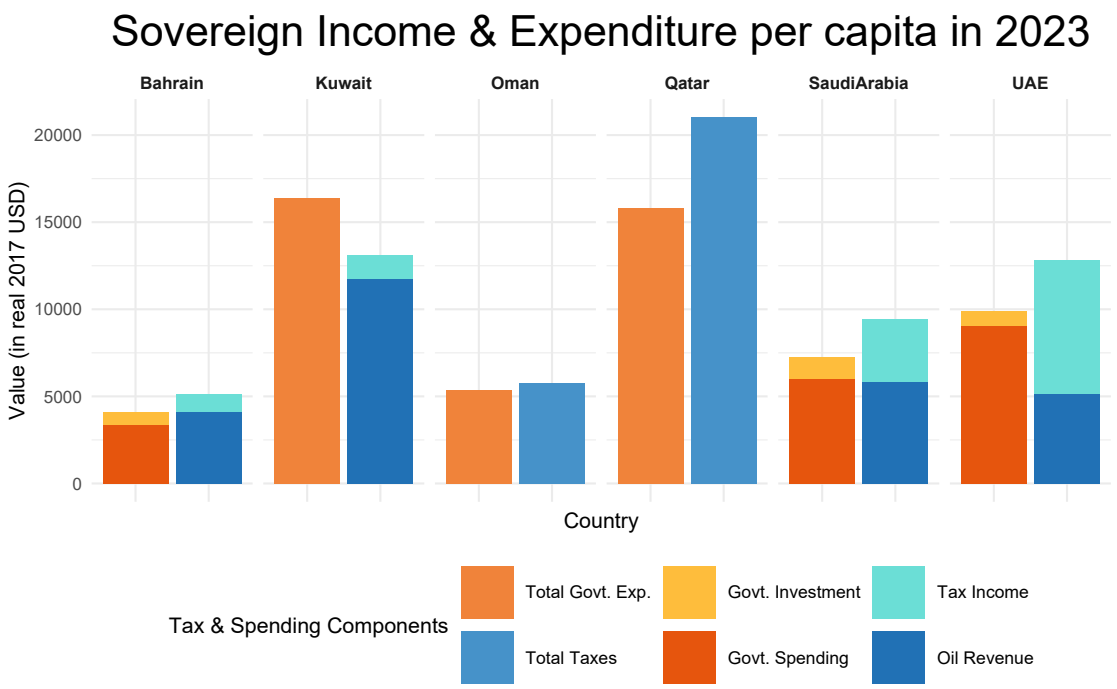

Figure C.1: Decomposition of aggregated government budgets per capita across the GCC.

This decomposition highlights the limitations to which the bulk of our analysis in the paper cannot be further split by specific government expenditure or income instruments. Recall that to ensure a consistent identification, we must use quarterly government income and/or expenditure data. A more in-depth decomposition moving beyond a categorization into non-hydrocarbon/hydrocarbon income and current/capital expenditures is not feasible with the quarterly data that we require. Consequently, it becomes impossible to analyze specific fiscal instruments of choice, which might yield more precise fiscal multiplier estimates following the evidence of Čapek et al. (2022).

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Consolidated *annual* government budget statistics allow for an extrapolative characterization of the nature of specific fiscal policy instruments in the GCC, even if they cannot be used for a multiplier estimation in line with the estimation exercises in the main body of the text. While a comprehensive analysis thereof lies outside of the scope of the paper, we provide here a more granular budget decomposition for the years 2014-2019 for Oman, which can be considered representative for the government budgeting dynamics in the GCC. We are able to do so with the help of consolidated government budget data obtained through Oman's Ministry of Finance.

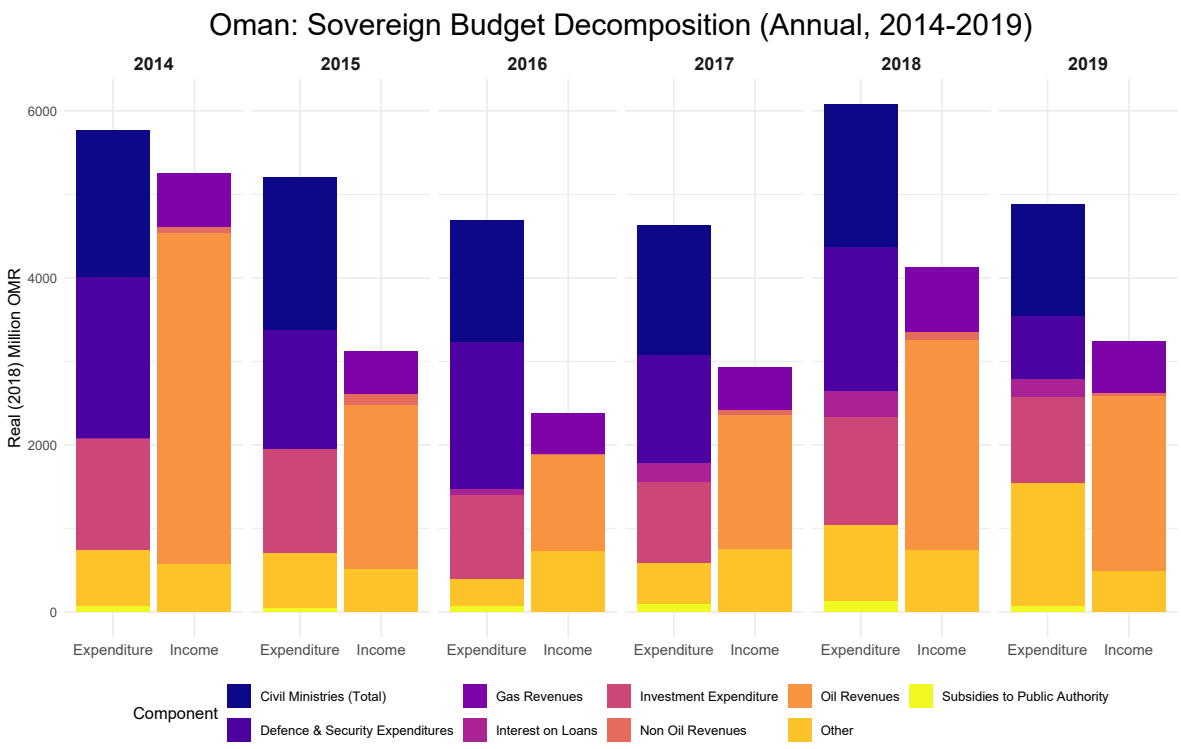

Figure C.2: Decomposition of the consolidated annual expenditure and income of the government of Oman.

On the expenditure side, central government spending is aligned with the provision of social assistance and other consumption-boosting measures, captured through the categories "Civil Ministries" and "Other". Broadly speaking, these elements can be thought of as automatic stabilizers for private demand induced through fiscal expenditures.

On the income side, the outsized role of hydrocarbon revenues becomes imminent. Non-hydrocarbon revenues mattered less in the pre-Covid period, although this situation changed markedly across all GCC member states since then with increased revenue diversification (The World Bank, 2025).

D Appendix D. First-stage estimation results

The following two tables present detailed first-stage estimation results in the impact period, once for government expenditures by each country; and once in the panel setting for each of the variables.

Table D.1: First-Stage IV Regressions on government expenditures

	Bahrain	Kuwait	Oman	Qatar	Saudi Arabia	UAE
BP-style shock	0.150***	0.428***	0.381***	0.332***	0.228***	0.332***
	(0.00386)	(0.0388)	(0.0277)	(0.0447)	(0.0100)	(0.00617)
L. Gross Demand Shock	-0.00154	0.0317*	0.0217**	-0.00372	-0.00140	0.00511
	(0.00322)	(0.0169)	(0.00861)	(0.0227)	(0.00516)	(0.00537)
L. Oil Consumption Demand Shock	-0.00454	-0.0457*	-0.0190*	0.00164	-0.00249	0.00736
	(0.00289)	(0.0244)	(0.0113)	(0.0129)	(0.00696)	(0.00789)
L. non-mining output	-0.00787	-0.00234	0.0557*	0.329***	-0.00478	-0.0177
	(0.0133)	(0.213)	(0.0294)	(0.121)	(0.0362)	(0.0128)
L. Govt. Exp.	-0.408***	-0.357***	-0.351***	-0.717***	-0.347***	-0.571***
	(0.0279)	(0.0266)	(0.0279)	(0.0468)	(0.0259)	(0.00844)
L. Govt. Income	-0.129***	0.0158	-0.231***	-0.0471***	-0.0986***	0.0167**
	(0.0240)	(0.0294)	(0.0362)	(0.0119)	(0.0152)	(0.00709)
Constant	-0.00109***	0.000533	-0.0000532	-0.00490	0.00128	-0.00269
	(0.000289)	(0.00743)	(0.00301)	(0.00298)	(0.00144)	(0.00171)
N	36	56	56	50	53	47
F	2572.8	100.0	143.6	34.42	275.4	2002.8
Under-ID Test (χ^2)	9581.6	343.0	492.5	120.1	951.9	7059.8
RMSE	0.00172	0.0368	0.0127	0.0255	0.00529	0.00558

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table D.2: First-Stage IV Regressions

	Expenditure	Current Exp.	Capital Exp.	Income	Non-oil income	Oil income
BP-style shock	0.373***	0.274***	0.0248***	0.423***	0.0823***	12.95***
	(0.0179)	(0.0239)	(0.00367)	(0.0801)	(0.0110)	(3.828)
L. Gross Demand Shock	0.0152*	0.00526	-0.000210	0.0156**	0.00288	2.262**
	(0.00889)	(0.00502)	(0.000970)	(0.00677)	(0.00375)	(1.042)
L.Oil Consumption Demand Shock	-0.00611	0.000959	0.000563	0.00854	0.00667*	3.761***
	(0.00619)	(0.00637)	(0.000747)	(0.0159)	(0.00381)	(1.360)
L.non-mining output	0.0501	0.0445	0.0258	-0.218***	0.0327	5.388
	(0.0328)	(0.0418)	(0.0205)	(0.0647)	(0.0471)	(13.60)
L. Govt. Exp.	-0.477***	-0.381***	-0.0760***	0.231***	-0.0155	-2.753
	(0.0340)	(0.0304)	(0.0225)	(0.0647)	(0.0213)	(5.550)
L. Govt. Income	-0.0491***	-0.0476***	-0.00980	-0.532***	-0.0666***	2.902
	(0.00802)	(0.0128)	(0.0112)	(0.0561)	(0.0237)	(5.622)
N	298	268	183	298	196	196
F	165.2	54.53	19.65	57.18	68.84	7.063
Under-ID Test (χ^2)	513.2	170.4	62.08	177.7	217.0	22.26
RMSE	0.0215	0.0241	0.00963	0.0558	0.0205	5.804

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$