

WP/19/304

IMF Working Paper

U.S. Monetary Policy Spillovers to GCC Countries: Do Oil
Prices Matter?

by Olumuyiwa S. Adedeji, Erik Roos, Sohaib Shahid, and Ling Zhu

***IMF Working Papers* describe research in progress by the author(s) and are published to elicit comments and to encourage debate.** The views expressed in IMF Working Papers are those of the author(s) and do not necessarily represent the views of the IMF, its Executive Board, or IMF management.

I N T E R N A T I O N A L M O N E T A R Y F U N D

IMF Working Paper

Middle East and Central Asia (MCD)

U.S. Monetary Policy Spillovers to GCC Countries: Do Oil Prices Matter?

Prepared by Olumuyiwa Adedeji, Erik Roos, Sohaib Shahid, Ling Zhu¹

Authorized for distribution by Tim Callen

December 2019

***IMF Working Papers* describe research in progress by the author(s) and are published to elicit comments and to encourage debate.** The views expressed in IMF Working Papers are those of the author(s) and do not necessarily represent the views of the IMF, its Executive Board, or IMF management.

Abstract

This paper provides empirical evidence that the size of the spillovers from U.S. monetary policy to non-oil GDP growth in the GCC countries depends on the level of oil prices. The potential channels through which oil prices could affect the effectiveness of monetary policy are discussed. We find that the level of oil prices tends to dampen or amplify the growth impact of changes in U.S. monetary policy on the non-oil economies in the GCC.

JEL Classification Numbers: E44, F14, F15, F42, O47

Keywords: Growth, Gulf Corporation Council, Spillovers, U.S. Monetary Policy

Authors' E-Mail Addresses: oadedeji@imf.org;erik.m.roos@gmail.com; sshahid@imf.org; lzhu@imf.org

¹ We are grateful to Tim Callen, Bikas Joshi, Stephane Roudet, and participants at the IMF MCD Discussion Forum for insightful comments. Alexandra Panagiotakopoulou and Esther George provided excellent editorial support.

CONTENTS

ABSTRACT	2
I. INTRODUCTION	4
II. STYLIZED FACTS: U.S. MONETARY POLICY AND GCC COUNTRIES	5
III. EMPIRICAL EVIDENCE OF MONETARY SPILLOVERS	8
A. Empirical Strategy	8
B. Empirical Findings	9
IV. CONCLUSION	12
REFERENCES	14
 TABLES	
1. Correlations Between U.S. and GCC Central Bank Policy Rates in Easing and Tightening Periods	5
2. Determinants of the GCC Non-Oil Real GDP Growth: Panel Regressions	10
3. Determinants of the GCC Non-Oil Real GDP Growth: Robustness Checks	13
 FIGURES	
1. Policy Rates	Error! Bookmark not defined.
2. GCC Current Account and Fiscal Balance, 2004–2018	6
3: GCC Liquidity and Oil Prices Growth	6
4: Saudi Banking System Excess Reserves	7
5. Oil Prices and Monetary Policy Transmission/	7
6. Impact of a 100 Basis Point Increase in the Federal Funds Rates on GCC’s	11

I. INTRODUCTION

Monetary policy in the GCC countries is sensitive to the monetary policy stance in the U.S. in view of the pegged exchange rate regimes to the U.S. dollar.² These pegs continue to serve GCC countries well, providing a clear and credible monetary anchor. Nonetheless, with open capital accounts and pegged exchange rate regimes, GCC countries are faced with the “trilemma”—i.e., their monetary policy cannot substantially deviate from the monetary policy stance in the U.S.³ The Fed raised policy rates during 2015-18 before reducing policy rates in 2019. An important question is how these changes have affected economic growth in the GCC.

Spillovers from monetary policy in the U.S. could be significant for other countries (Dahlhaus and Vasistha 2014; Caceres et al. 2016), particularly for those with pegged exchange rate regimes. In terms of GCC specific studies, an increase of 150 basis points in the federal funds rate was found to decrease non-oil activity in the GCC by 1.5 percentage points two years after the shock (Prasad and Khamis, 2011).

This paper adds to the literature by providing empirical evidence that the size of the spillovers from U.S. monetary policy to non-oil GDP growth in GCC countries depends on the level of oil prices. Oil prices are critical to the size of monetary policy spillovers because they can amplify or dampen the growth impact.

The level of oil prices – through the effect on domestic liquidity – could potentially dampen or amplify the impact of interest rate changes on non-oil GDP growth. In this regard, monetary policy tightening that coincides with increased liquidity associated with higher oil prices would tend to have a more limited growth impact. While the opposite would be the case if monetary tightening is accompanied by lower oil prices and less liquidity.

Against this background, this paper investigates how oil prices affect U.S. monetary policy spillovers to non-oil GDP growth in the GCC countries. Specifically, GCC countries’ non-oil real GDP growth rates are modeled using panel models with the U.S. real interest rates and the real oil price as explanatory variables. The focus is on non-oil real GDP instead of the total real GDP. This allows for a cleaner identification of the monetary policy spillovers, given the oil component of the GDP is largely driven by production decisions made on the basis of developments in the global oil market (Adedeji et al. 2018).

To our knowledge, this paper is the first attempt in the literature to study the impact of the U.S. monetary policy spillovers on oil-exporting economies, taking into consideration the level of oil prices. The results suggest that at a real oil price of \$35 a barrel, a 100 basis-point

² In the case of Kuwait, the exchange rate is pegged to a basket of currencies.

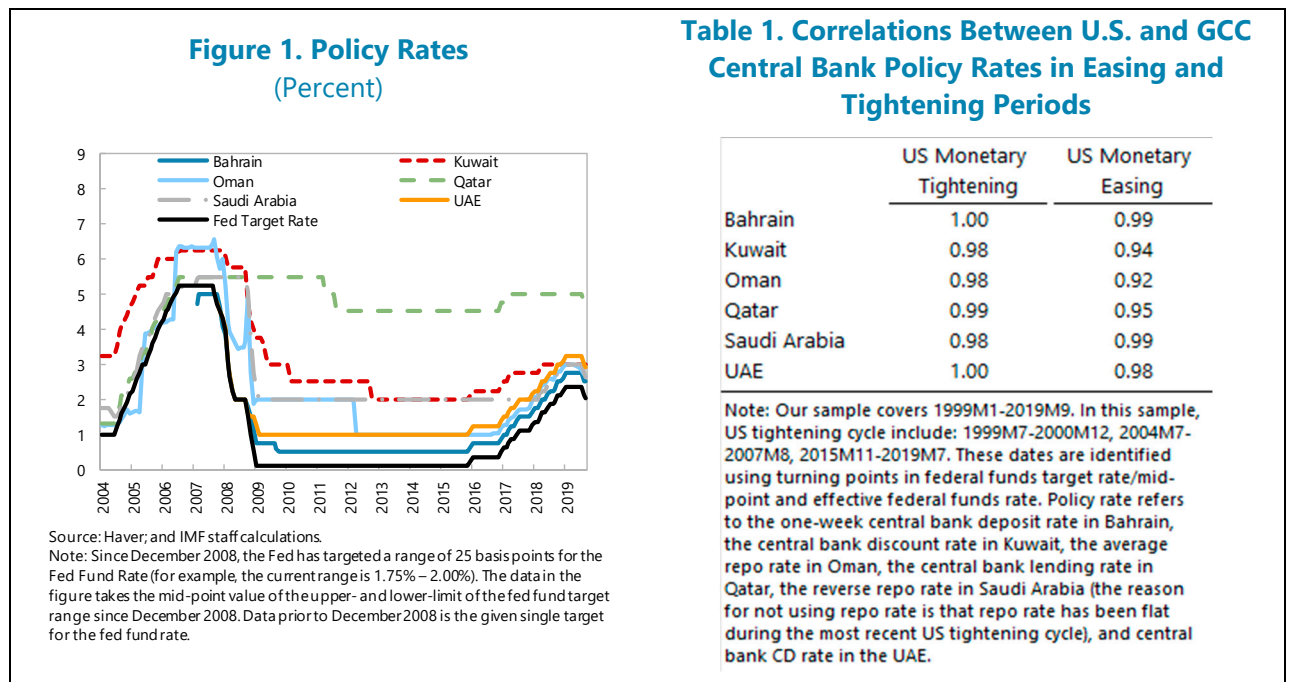
³ The open economy “trilemma” and its empirical examinations indicate that countries with pegged exchange rate regimes tend to give up their domestic monetary autonomy (see Obstfeld et al. 2004; 2005; 2010). The trilemma is the proposition that at any one time a country can pursue only two of the three following options: a fixed exchange rate, open capital markets, and monetary autonomy. Theoretically, a fixed exchange rate regime and an open capital account imply interest rate parity.

increase in the U.S. real policy interest rate leads to a drop in annual non-oil real GDP growth of a $\frac{1}{3}$ percentage point. If the real oil price, however, were \$30 a barrel, the same 100 basis-point increase in the U.S. real policy interest rate would lead to a decrease in the annual non-oil real GDP growth rate of almost $\frac{2}{3}$ percentage point. The spillover from U.S. monetary policy disappears when the real oil price rises above \$43 a barrel.

The rest of the paper is organized as follows: Section II focuses on stylized facts with emphasis on the relationship between U.S. and GCC monetary policy. Section III discusses empirical evidence on growth spillovers associated with movements in monetary policy in the U.S. Section IV concludes and offers policy recommendations.

II. STYLIZED FACTS: U.S. MONETARY POLICY AND GCC COUNTRIES

The GCC monetary authorities conduct monetary policy in the context of pegged exchange rate regimes. GCC policy rates broadly follow U.S. interest rates. During the past three years, most GCC central banks have been moving domestic policy rates in line with the U.S. Federal Reserve which is consistent with previous U.S. tightening and easing cycles (Figure 1 and Table 1).

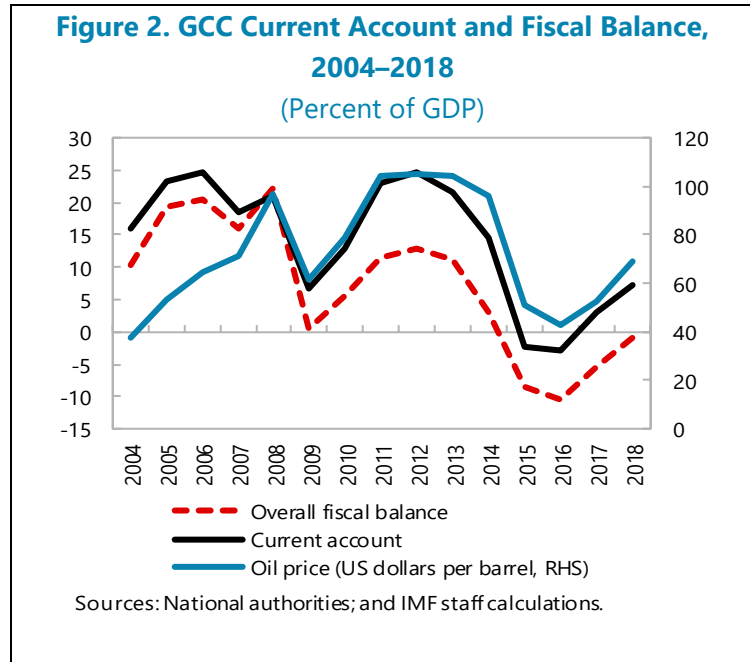


GCC countries depend significantly on oil as their main source of export and fiscal revenues. Between 2013–17, the average contribution of the oil sector to the total GCC GDP was 35 percent.⁴ Oil contributed about 62 percent of GCC exports and 72 percent of GCC government revenues. Since oil forms a large component of exports and government revenue,

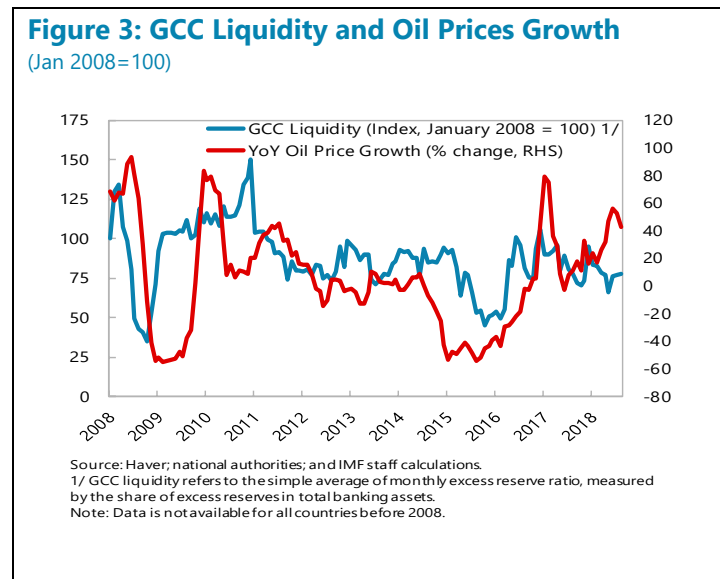
⁴ The oil sector in the GCC also influences the non-oil sector through the governments' expenditure function. Since oil revenue is the main source of fiscal revenue, the effect on the non-oil economy is seen through the government spending these revenues on compensation to public sector employees, subsidies and transfers, and investment in infrastructure, real estate, education, and health (Fouejieu et al. 2018). GCC countries are focusing on decoupling public spending from volatile oil prices, including through the use of medium-term fiscal frameworks.

it has a strong relationship with the current account and fiscal positions of GCC countries. Oil prices, the current account, and the fiscal balance usually move in tandem in the GCC (Figure 2).

“Liquidity” is defined as the subset of central bank domestic currency liabilities vis-à-vis commercial banks that is readily available for payments purposes, essentially commercial bank excess reserves at the central bank.⁵ The operation of monetary policy is complicated by the large oil price-driven liquidity fluctuations. Large external and fiscal surpluses during periods of high oil prices have generally been associated with increases in liquidity, reversed during times of low oil prices (Figure 3).



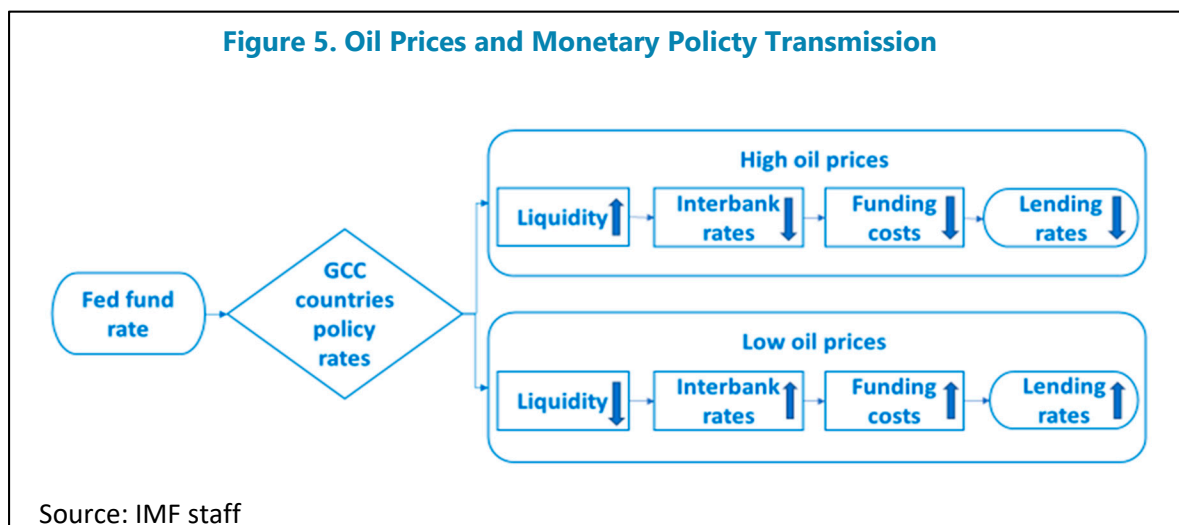
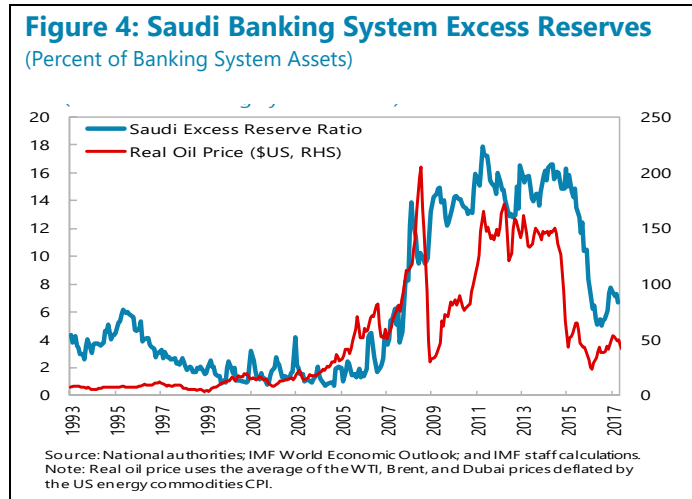
For example, there is a clear structural break in Saudi Arabia’s excess reserve ratio in 2004 (the only country for which we have a long time series of data), coinciding with a structural break in the real oil price (Figure 4). The real oil price was stable around \$25/barrel from 1993 to the early 2000s. It then increased in 2003 and has stayed above \$40/barrel since 2004. Following an almost identical path, excess liquidity in Saudi Arabia was low through most of 1990s and early 2000s and went up in 2004 and has stayed high since.



⁵ See Gray (2008) for a more-detailed discussion.

Central banks manage liquidity to limit imbalances and ensure that short-term market interest rates are consistent with their policy rates and to avoid actions by banks that may run counter to their objectives. While banks typically want to hold a certain level of liquidity for payment and precautionary purposes, excess liquidity can find its way into the interbank market, translating into lower interest rates and higher credit growth. Tight liquidity conditions can increase the cost of funding for banks and lead to higher lending rates that curtail credit expansion with potential implications for growth.

Central bank liquidity management operations are important to facilitate monetary policy implementation. Depending on liquidity conditions – associated with oil prices – market interest rates may deviate from policy rates. Too abundant liquidity due to high oil prices leads banks to supply more loans to other banks through the interbank market. This puts downward pressure on interbank rates, reduces banks funding costs, and prompts them to pass it on to borrowers in the form of lower lending rates (See Figure 5).⁶ Therefore, oil price driven liquidity fluctuations can generate an undesired divergence with policy rates and impede monetary policy transmission.



In some GCC countries, liquidity swings have made it more difficult for central banks to steer short-term market interest rates, with liquidity imbalances reducing the pass through of policy rates to interbank rates (IMF, 2017). Interbank rates may increase by a larger extent

⁶ The opposite effects are in play depending on the level of oil prices.

than normally entailed by policy rates if oil prices and liquidity decline, with banks in turn charging higher rates for loans, slowing down the demand for credit and consequently economic growth. This same paper IMF, 2017, establishes that in GCC countries, interbank rates have indeed been influenced by liquidity conditions, with tighter system liquidity pushing rates up. It finds that higher liquidity (measured as excess reserves) is associated with lower interbank market interest spreads (vis-a vis policy rates which could weaken the pass through of policy rates to interbank market rates with implications for lending and deposit rates).

III. EMPIRICAL EVIDENCE OF MONETARY SPILLOVERS

A. Empirical Strategy

This section analyzes the growth impact of a change in U.S. monetary policy on the GCC countries. Specifically, we examine the impact of the U.S. real interest rate and the U.S. real GDP growth on the non-oil real GDP growth in GCC using a panel regression with fixed effects.

It is well established empirically that the spillovers from U.S. monetary policy to GCC countries can be significant (Prasad and Khamis, 2011). We contribute to this field of research by allowing the size of the U.S. monetary policy spillover to depend on real oil price. The closest work to our paper is di Giovanni and Shambaugh (2008). Examining the role of exchange rate regimes on the U.S. monetary policy spillovers, they found the spillovers to be larger in countries with fixed exchange rate regimes. To our knowledge, our paper is the first in the literature to examine the role of oil prices on the size of the U.S. monetary policy spillovers.

To investigate spillovers from a change in the U.S. monetary policy stance on GCC economies, we use a similar approach to di Giovanni and Shambaugh (2008).⁷ Specifically, we consider the following fixed-effects panel regression specification:

$$ny_{i,t} = \alpha_i + \beta_1 r_t^{US} + \beta_2 oil_t + \beta_3 r_t^{US} \times oil_t + \beta_4 y_t^{US} + \varepsilon_{i,t} \quad (1)$$

where $ny_{i,t}$ denotes the non-oil real GDP growth in country i in year t . α_i captures the country fixed effects. r_t^{US} denotes the U.S. real interest rate, computed by deflating the effective federal funds rate with U.S. CPI inflation rate.⁸ oil_t denotes the real oil price, which is computed by first taking the simple average of three spot prices (Brent, West Texas Intermediate, and the Dubai Fateh), all in U.S. dollars per barrel, and then deflated by the U.S. CPI. The real oil price is then logged for an easier interpretation of its coefficient size (its coefficient can be interpreted as an elasticity). $r_t^{US} \times oil_t$ is the interaction between the

⁷ As a robustness check, a linear time effect is included as an additional control variable as in IMF, 2013. We find its coefficient to be insignificant, and other results continue to hold.

⁸ In one of the robustness checks, Wu-Xia shadow Federal Funds rate is used instead of effective Federal Funds Rate during the quantitative easing period to account for the zero-lower bound.

U.S. real interest rate and the real oil price to capture the potential impact of the oil price on the U.S. monetary policy spillover. y_t^{US} denotes the U.S. real GDP growth rate. $\varepsilon_{i,t}$ denotes the standard error. To control for both cross-country and cross-time correlations in the error terms, Driscoll-Kraay (1998) standard errors are computed.⁹

We expect β_1 to be negative, as has been well established in the literature, because of the trilemma (See Section I). A higher real interest rate (abstracting from the liquidity impact of oil price movement) would be expected to lead to reduced credit to the private sector and consequently, lower real non-oil GDP growth. We expect β_2 to be positive, since higher oil price can boost consumption and investment confidence and aggregate demand. We expect β_4 , the coefficient on the U.S. real GDP growth to be positive—it captures external demand, which has positive impact on non-oil exports.

The other key variable of interest is β_3 —the coefficient on the interaction between the real oil price and the U.S. real interest rate—which is expected to be positive as we expect the U.S. monetary policy spillover to be weaker when oil prices are higher.¹⁰

B. Empirical Findings

Table 2 presents panel regression results.¹¹ The first column reports the regression results without the interaction term in equation (1); the second column shows the results with the interaction term. The data are from national authorities and Haver Analytics. When the interaction term is omitted, none of the explanatory variables are significant and the coefficient on the U.S. policy rate has the wrong sign. Once we control for the interaction term, all explanatory variables become significant with expected signs.

We find significant spillovers from U.S. monetary policy on non-oil real GDP when the interaction term between the oil price and the U.S. policy rate is included—when U.S. real interest rates increase, non-oil real GDP growth rates decline in the GCC countries. Moreover, we find that the size of the spillover increases when the oil price is lower. In other words, the impact of the U.S. real interest rate on the GCC non-oil real GDP growth is larger when oil prices are lower.

To see this relationship between the oil price and the spillover from U.S. monetary policy, we plot the spillover coefficient, $\beta_1 + \beta_3 oil$ in Figure 6. The figure shows the relationship

⁹ The error structure is assumed to be heteroskedastic, autocorrelated, and possibly correlated between panels. Driscoll-Kraay standard errors are robust to very general forms of cross-sectional and temporal dependence, especially when the time dimension becomes large.

¹⁰ The impact of low oil prices on the U.S. monetary policy shock can be asymmetric as an interest rate hike could have larger adverse impact than the potential positive impact of an interest rate cut at low oil prices. We empirically tested this asymmetry using dummy and interaction variables to allow the impact of oil price on the U.S. monetary policy spillover to differ depending on the direction of the U.S. interest rate change. However, we find no empirical evidence of any asymmetry.

¹¹ Oman changed its statistical method of non-oil GDP in 1998, leading to a structural break in the data.

between the oil price and the impact of a 100 basis point increase in federal funds rate on GCC's non-oil real growth rate. When the real oil price is \$30 per barrel (at constant 2019 prices), a 100 basis point increase in the federal funds rate is associated with around a $\frac{2}{3}$ percentage point decline in non-oil real GDP growth rate on average in the GCC; the impact reduces to a $\frac{1}{3}$ percentage point decline if the oil price is at \$35 a barrel; and disappears when the oil price rises above \$43 a barrel (i.e. it becomes statistically insignificant).¹²

VARIABLES	(1)	(2)	(3)
<i>US real interest rate</i>	0.287 (0.811)	-6.073** (2.619)	-1.321*** (0.270)
<i>Interaction variable between US real interest rate and logged real oil price</i>		1.619** (0.607)	
<i>Interaction variable between US real interest rate and High oil price dummy</i>			2.659*** (0.512)
<i>Logged real oil price</i>	3.484 (2.657)	3.468** (1.653)	
<i>High oil price dummy</i>			1.773 (1.329)
<i>US real GDP growth</i>	0.501 (0.346)	0.732** (0.308)	0.698** (0.292)
<i>Constant</i>	-8.804 (10.68)	-8.225 (6.799)	5.126*** (0.684)
Observations	154	154	154
Sample coverage	1991-2017	1991-2017	1991-2017
Number of GCC countries	6	6	6

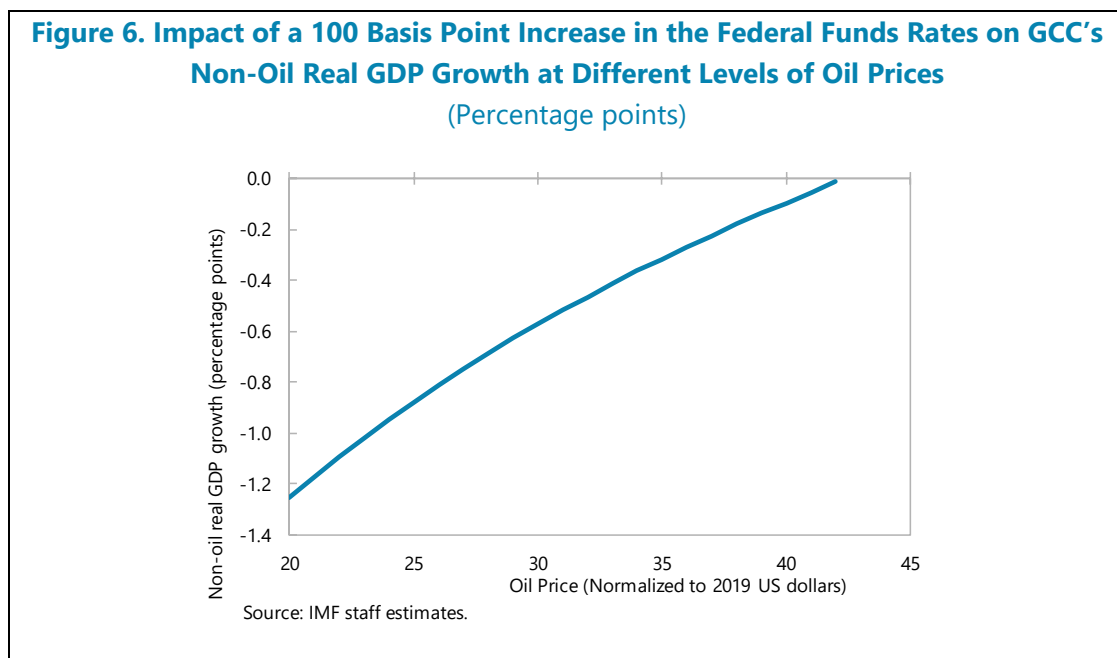
Notes: 1. *** p<0.01, ** p<0.05, * p<0.1; 2. All regressions include country fixed effects; 3. All coefficients are estimated using panel OLS regressions; 4. Driscoll-Kraay standard errors are reported in the parentheses.

Given that the annual real oil price has been above \$43 since 2004, the identified non-linearity in the U.S. monetary policy spillover could reflect the structural break in the real oil

¹² The real annual oil price is below \$30 a barrel (2019 price) for one-fifth of the time between 1990–2018. Note that by construction, the spillover would change direction (U.S. interest rate hike improves non-oil growth) once the oil price is high enough. The “break-point” oil price is given by $\exp\left(-\frac{\beta_2}{\beta_4}\right)$, which equals \$43 a barrel in the baseline result. This result should be interpreted as that there is a level of oil price above which the spillover from U.S. monetary policy becomes insignificant on the domestic economy.

price—and more importantly the structural break in GCC excess liquidity. The higher real oil price since 2004 has led to structurally higher excess liquidity in the GCC (relative to 1990s), which consequently has weakened the monetary policy transmission mechanism to spillovers from U.S. monetary policy.

As a robustness check, to reduce potential multicollinearity between the real oil price and the U.S. real interest rate, we replace the real oil price with a dummy variable which is set to one when the real oil price is higher than the historical long-run average of \$43 a barrel and zero otherwise. The results, reported in column (3), support the finding that U.S. monetary policy spillovers depend on oil prices—higher U.S. interest rates only have an adverse impact on GCC non-oil real GDP growth when oil prices are low. This result is robust to setting the high oil price threshold at different levels.



In addition, we conduct several robustness checks which confirm our findings. Results are reported in Table 3. First, since Saudi Arabia has a large oil market share, to ensure findings are not driven by potential endogeneity between the oil price and Saudi non-oil growth, we re-run the regressions excluding Saudi Arabia from the sample. The results are reported in columns (1)-(2). Second, we replace U.S. real GDP growth with world real GDP growth to account for external demand from other increasingly important trading partners such as China. The results are reported in columns (3)-(4). Third, to account for quantitative easing in the aftermath of the global financial crisis, we replace effective federal funds rate with Wu-Xia shadow Federal Funds rate when the federal funds rate hit the zero-lower bound, and the results are reported in columns (5)-(6). Fourth, we add the real growth rate of government spending to control for omitted variable bias. The results are reported in columns (7)-(8). The coefficient on government spending is positive as expected and the other findings continue to hold. Finally, we use different thresholds for defining the high oil price dummy and the results are reported in columns (9)-(10). The robustness check results confirm the key finding

that the spillover impact of U.S. monetary policy on the GCC non-oil real GDP growth rate depends on the oil price—the spillover weakens at higher oil prices.

IV. CONCLUSION

This paper has assessed monetary policy spillovers from the U.S. to GCC economies with emphasis on the role of oil prices. GCC policy rates broadly follow the Fed funds rate. There is evidence, however, that the level of oil prices matters for how changes in U.S. interest rates affect non-oil GDP growth in the GCC. Oil price-driven liquidity fluctuations impact the effects of monetary policy on non-oil growth. At current oil price levels, the impact of changes in U.S. interest rates on non-oil growth in the GCC appear likely to be minimal.

Table 3. Determinants of the GCC Non-Oil Real GDP Growth: Robustness Checks

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	GCC Without Saudi Arabia		World GDP Growth		US Shadow Rate		Government Spending		\$50 Threshold	\$60 Threshold
<i>US real interest rate</i>	-7.293** (2.902)	-1.583*** (0.310)	-4.688** (2.246)	-1.138*** (0.296)	-4.771* (2.539)	-1.342*** (0.263)	-6.464** (2.540)	-1.462*** (0.292)	-0.961** (0.456)	-1.053* (0.562)
<i>Interaction variable between US real interest rate and logged real oil price</i>	1.923*** (0.680)		1.246** (0.510)		1.262** (0.566)		1.680*** (0.583)			
<i>Logged real oil price</i>	3.153 (1.867)		1.785 (1.641)		4.326** (1.877)		3.109* (1.715)			
<i>Interaction variable between US real interest rate and High oil price dummy</i>		3.157*** (0.554)		2.302*** (0.432)		2.188*** (0.548)		2.675*** (0.513)	2.272*** (0.603)	2.595*** (0.624)
<i>High oil price dummy</i>		1.452 (1.395)		0.399 (1.066)		1.876 (1.658)		1.565 (1.409)	2.949*** (1.051)	3.664*** (1.288)
<i>US real GDP growth</i>	0.803** (0.331)	0.805** (0.322)			0.786** (0.299)	0.709** (0.264)	1.032** (0.413)	1.016** (0.439)	0.689** (0.296)	0.808*** (0.237)
<i>World real GDP growth</i>			0.976** (0.469)	1.152*** (0.394)						
<i>Government spending real growth rate</i>							0.074* (0.044)	0.0678* (0.039)		
<i>Constant</i>	-6.629 (7.643)	5.645*** (0.757)	-3.561 (6.527)	3.183** (1.326)	-11.60 (7.744)	5.116*** (0.622)	-7.846 (6.744)	4.125*** (1.195)	4.263*** (0.875)	3.946*** (1.253)
Observations	127	127	154	154			149	149	154	154
Number of GCC countries	5	5	6	6			6	6	6	6

Notes: 1. *** p<0.01, ** p<0.05, * p<0.1; 2. All regressions include country fixed effects; 3. All coefficients are estimated using panel OLS regressions; 4. Driscoll-Kraay standard errors are reported in the parentheses.

REFERENCES

- Adedeji, Olumuyiwa S., Sohaib Shahid, and Ling Zhu. 2018. "Saudi's Growth and Financial Spillovers to Other GCC Countries: An Empirical Analysis" IMF Working Paper WP/18/278 (Washington: International Monetary Fund).
- Caceres, Carlos, Yan Carrière-Swallow, Ishak Demir, and Bertrand Gruss. 2016. "U.S. Monetary Policy Normalization and Global Interest Rates." IMF Working Paper WP/16/195 (Washington: International Monetary Fund).
- di Giovanni, Julian and Shambaugh, Jay C., 2008. "The impact of foreign interest rates on the economy: The role of the exchange rate regime", *Journal of International Economics*, Elsevier, vol. 74(2), pages 341-361, March.
- Dahlhaus, Tatjana and Vasishtha, Garima. (2014). "The Impact of U.S. Monetary Policy Normalization on Capital Flows to Emerging-Market Economies", Staff Working Papers, Bank of Canada.
- Driscoll, John, and Aart Kraay. 1998. "Consistent Covariance Matrix Estimation With Spatially Dependent Panel Data", *The Review of Economics and Statistics*, 1998, vol. 80, issue 4, 549-560.
- Espinoza, Raphael and Ananthkrishnan Prasad. 2012. "Monetary Policy Transmission in the GCC Countries" IMF Working Paper WP/12/132 (Washington: International Monetary Fund).
- Fouejieu, Armand, Sergio Rodriguez, and Sohaib Shahid. 2018. "Fiscal Adjustment in the Gulf Countries: Less Costly than Previously Thought." IMF Working Paper WP/18/133 (Washington: International Monetary Fund).
- Gray, Simon, "Liquidity Forecasting." Handbook No.27. Centre for Central Banking Studies, Bank of England.
- International Monetary Fund. 2013. "Dancing Together? Spillovers, Common Shocks, and the Role of Financial and Trade Linkages." World Economic Outlook, October 2013: Chapter 3 (Washington: International Monetary Fund).
- _____. 2016b. "The Growing Importance of Financial Spillovers from Emerging Market Economies." Global Financial Stability Report, April 2016: Chapter 2 (Washington: International Monetary Fund).
- _____. 2017. "Strengthening Liquidity Management Frameworks in Support of Stability and Growth in the GCC" (Washington: International Monetary Fund).
- Mizen, Paul, and Boris Hofmann. 2002. 'Base Rate Pass-Through: Evidence from Banks' and Building Societies' Retail Rates." Bank of England Working Paper No. 170 (London).

Obstfeld, Maurice, Jay C. Shambaugh, and Alan M. Taylor. 2004. "Monetary Sovereignty, Exchange Rates, and Capital Controls: The Trilemma in the Interwar Period", *IMF Staff Papers*, Palgrave Macmillan, vol. 51(s1), pages 75-108, June.

Obstfeld, Maurice, Jay C. Shambaugh, and Alan M. Taylor. 2005. "The Trilemma in History: Tradeoffs Among Exchange Rates, Monetary Policies, and Capital Mobility", *The Review of Economics and Statistics*, MIT Press, vol. 87(3), pages 423-438, August.

Obstfeld, Maurice, Jay C. Shambaugh, and Alan M. Taylor. 2010. "Financial Stability, the Trilemma, and International Reserves", *American Economic Journal: Macroeconomics*, American Economic Association, vol. 2(2), pages 57-94, April.

Prasad, Ananthakrishnan, and May Khamis. 2011. "Monetary Policy and the Transmission Mechanism in the GCC Countries." *Gulf Cooperation Council Countries: Enhancing Economic Outcomes in an Uncertain Global Economy* (2011): 47-63.

Scharler, Johann and Claudia Kwapil. 2010. "Interest Rate Pass-Through, Monetary Policy Rules, and Macroeconomic Stability." *Journal of International Money and Finance*, 2010, Vol. 29(2), pp. 236-261.

Sellon Jr., G. 2002. "The Changing US Financial System: Some Implications for Monetary Transmission Mechanism." *Federal Reserve Bank of Kansas City Economic Review*, First Quarter.