After the Shock
Reform, Resilience, and Economic Transformation in MENA
ERF 32nd Annual Conference
June 14-16 | Cairo, Egypt

2026

Evaluating a US Policy Rate Threshold Effect on Economic Growth in the GCC Region:

Do Oil Prices Matter?

Assil El Mahmah

ECONOMIC RESEARCH FORUM
منتدى البحوث الاقتصادية

Evaluating a US policy rate threshold effect on economic growth in the GCC region: Do oil prices matter?[1]

Assil EL MAHMAH[2]

Abstract

This paper re-examines the influence of US interest rates on economic growth in the GCC region, aiming to deepen our understanding of the complicated dynamics at play, using a Threshold Structural Vector Autoregression (TSVAR) approach. Four main results are found in this investigation. *First*, GCC policy rates broadly follow the Fed funds rate. However, the pass-through of the US monetary policy to retail rates in the GCC countries follows an asymmetric relationship. This suggests that the impact of US policy on interbank interest rates, and consequently economic growth, varies depending on the direction and the magnitude of the US interest rate change. *Second*, the US monetary policy spillover to the GCC region is more important when the US interest rate exceeds the rate of 2.25%. A lower interest rate has a limited impact on GCC economies. This suggests that a minimum threshold of monetary tightening is required in the US before it generates meaningful destabilizing or restrictive effects on the GCC's economic activity. *Third*, the response of GCC interbank rates to liquidity fluctuations is quite limited during periods of lower US interest rates, while rates remain highly sensitive in the opposite context. This suggests that banks may be reluctant to pass on rate increases when they can secure funding at lower costs, particularly in environments characterized by lower policy rates or excess liquidity. *Finally*, the level of oil prices also matters for how changes in US interest rates affect non-oil GDP growth in the GCC. Higher US interest rates only harm GCC non-oil real GDP growth when oil prices are low, below $72.3 per barrel. These results could provide valuable insights for policymakers in the region to better handle US spillovers, by creating policy scenarios based on this analysis and using the right tools to proactively manage economic risks.

Keywords: Economic growth, Interest rate, Panel data, Threshold Vector Autoregression, GCC region.

JEL classification : E44, F15, F42, O47

[1] The views expressed in this paper are those of the author and do not in any way purport to represent those of any institution.

[2] Economic Advisor, Ministry of Economy and Planning – Saudi Arabia, aelmahmah@mep.gov.sa

I. Introduction

The GCC[3] countries maintain a policy of open capital accounts and a pegged exchange rate (except for Kuwait), consequently reducing their freedom to run an independent monetary policy. Therefore, most of the GCC central banks[4] have closely aligned their policy rates with the direction of the Fed's monetary policy. This close alignment aims to prevent any pressure on the peg that might arise from a growing gap between the Fed's policy rate and GCC interest rates, which could lead to capital flowing in or out and risk destabilizing the exchange rate.

Although these pegs continue to serve GCC countries well, providing a clear and credible monetary anchor, the frequent divergent business cycles between the United States (US) and GCC economies in the last two decades have raised concerns regarding the cost and the efficiency of a dependent GCC monetary policy. The Fed decides to hike or cut its policy rate depending only on the US economic conditions, without any consideration of the impact of its policies on the GCC economy. This is especially true when the direction of the Fed's monetary policy contradicts the desired direction of the GCC monetary policies. For example, some GCC countries were suffering from double-digit inflation in 2007-2008, attributed to the oil price boom, when the Fed started its easing monetary cycle. Also, during 2017-2018, GCC economies slowed down with the decline in the oil price at a time when the Fed started its monetary tightening cycle. More recently, GCC inflation has fallen sharply from its peak in 2022, but interest rates are still high in this region, as the Fed keeps delaying rate cuts.

The inconsistency between US monetary policy and GCC economic conditions has prompted some GCC central banks, on a few occasions, not to adjust their rates in line with the Fed's rate due to domestic factors such as inflationary pressure, credit slowdown, or economic recessions. This raises important questions: Do US monetary policy spillovers to GCC countries follow a symmetric relationship depending on the oil price? Is there a specific threshold of the US policy rate beyond which the GCC economic growth is affected differently? Could the oil price level amplify or reduce the size of monetary policy spillovers?

---

[3] The GCC countries refers to the six member states of the Gulf Cooperation Council (GCC): Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates (UAE).

[4] Kuwait's currency is not pegged to the dollar, instead is linked to a basket of currencies. However, given the currency basket to which the currency is pegged has substantial dollar weightage, the Central Bank of Kuwait (CBK) follows almost all the time the US monetary policy.

Many empirical studies are conducted at the individual country level or employ panel data with various estimation methods to examine the symmetric relationship between interest rates and economic growth. However, the asymmetrical relationship between them is still ambiguous and has not been comprehensively considered, mainly in the GCC region. In fact, given the importance of the oil sector in this region, the results on the impact of interest rates are heterogeneous, reflecting the complex relationship between US monetary policy and GCC economic growth, mainly during low and high oil price periods. The level of oil prices, through the effect on domestic liquidity and government spending, 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 was accompanied by lower oil prices and less liquidity.

This paper aims to fill an important gap in the impact of interest rates on economic growth in the GCC region, and shed light on the policy rate threshold effect, as traditional linear models appeared to be insufficient to capture these nonlinear effects. This paper adds to the literature by providing empirical evidence that the size of the spillovers from US monetary policy to non-oil GDP growth in GCC countries depends also on the level of oil prices. Oil prices are critical to the size of monetary policy spillovers as they can amplify or dampen the impact of growth.

Regarding the adopted methodology, this paper employed Threshold Structural Vector Autoregression (TSVAR) approach for the GCC region, to capture the impact of non-linearity in the response of non-oil GDP to US monetary policy shocks, depending on the oil price levels.

The remainder of this paper is organized as follows. Section II provides a literature review on the relationship between interest rates and economic growth, while section III describes the used data and explains our adopted macroeconomic framework. Section IV presents empirical results and discusses some interpretations. Finally, Section V concludes with some policy implications.

II. Literature Review

The symmetric relationship between monetary policy and economic growth has been a focal point of economic research worldwide, particularly in understanding how changes in US interest rates

influence domestic and international economic conditions. However, there has been relatively little research done on the monetary policy of GCC states. In theory, interest rates have a negative relationship with economic growth as explained by Barro and Becker (1989) and Shaw (1973), which is consistent in some GCC specific empirical studies. Al-Shammari (2018) found that higher interest rates have a negative impact on economic growth in GCC countries, primarily through decreased investment, while Eid et al. (2019) discussed how tightening monetary policy, reflected in higher interest rates, negatively affects GCC growth by limiting credit availability and investment.

Conversely, some publications argue that there is no significant correlation between interest rates and economic growth rates in the GCC region, or in other words, interest rates do not have a negative or positive impact on these economies. Several studies explained this ambiguity by the fact that GCC countries typically maintain fixed exchange rates, which can complicate the transmission of interest rate changes to the economy. Espinoza and Prasad (2012) found that the pass-through of US policy rates to domestic rates is low due to shallow money markets and the way GCC central banks operate, as these countries maintain a policy of open capital accounts and a pegged (or nearly pegged) exchange rate. Also, this relationship may be influenced by oil prices, affecting government spending and investment behavior. Adedeji et al. (2019) confirmed that the size of the spillovers from US monetary policy to non-oil GDP growth in the GCC countries depends on the level of oil prices. They reveal that oil price fluctuation – through the effect on domestic liquidity – could potentially dampen or amplify the impact of interest rate changes on non-oil GDP growth.

After reviewing the literature on the symmetric impact of monetary policy instruments on economic growth, there is no consensus on whether the impact is positive or negative, as this relationship could be influenced by various factors, including specific country contexts, policy responses, and global economic conditions. This can obscure the hidden effects of interest rates.

To address this question, a few recent papers have focused on the asymmetric relationship. Forni et al. (2020) found that US monetary policy shocks have asymmetric effects on US Treasury and global bond yields, with a clear break around the great financial crisis. Kim, M. (2024) analyzed data from 34 developing economies from 1992-2022 using a panel threshold (PTR) model to find that interest rates at or below 5.286% fostered economic growth. More recently, Saungweme et al. (2025) used the nonlinear autoregressive distributed lag (NARDL) model to investigate the asymmetric effects of lending interest rates on economic growth in Kenya using annual time series data from 1980-2021.

The study finds evidence of a long-run asymmetric relationship, where negative interest rate shocks spur economic growth in the short run but impede it in the long run.

Empirical studies on the nonlinear effects of monetary policy shocks on GCC economies have been very limited. Adedeji et al. (2019) empirically tested this asymmetry using dummy and interaction variables to allow the impact of oil price on the US monetary policy spillover to differ depending on the direction of the US interest rate change. However, they found no empirical evidence supporting the existence of asymmetry. This contrasts with findings in other economies, where the effects of monetary policy are often found to be asymmetric, with contractionary policies having a stronger impact than expansionary ones.

In our paper, we build upon existing literature by introducing several key innovations. *First*, we explore the US monetary policy spillover to GCC economies, particularly in the context of oil price fluctuations, using a Threshold Structural Vector Autoregression (TSVAR) approach. As traditional linear models appeared to be insufficient to capture these nonlinear effects, this model segments the data into distinct regimes based on the threshold variable, allowing for varied dynamics and response patterns to shocks within each regime. *Second*, we utilize quarterly data for the GCC region, in contrast to most existing studies that rely on annual data and focus solely on panel data analysis. The annual datasets are often too limited for robust country-specific model estimation. *Finally*, given that TSVAR is fundamentally applied exclusively to time series data, and does not apply to panel data, we consider the six countries in this paper as a single economy, as they have high levels of economic integration, and pegged (or nearly pegged) their currencies to the US dollar, leading to similar monetary policy impacts across the region. This approach has addressed many technical problems and allowed us to benefit from all the advantages of the TSVAR.

III. Adopted Methodology

This section presents our adopted approach to examine the asymmetric impact of interest rates on economic growth in the GCC region. To this end, we describe the selected variables, taking into consideration the existing literature, data limitation, and the intended objectives. Then, we specify the appropriate econometric model for our study, to draw proper conclusions based on the results.

III.1. Data description

To assess the effects of US monetary policy on GCC economies, We use quarterly data for the GCC region, treating it as a single economy, covering the period from Q1 2010 to Q2 2025. The selected variables included in our model are as follows: 1) Real Federal Funds Rate (**FFR**), which is used as a proxy for the US monetary policy instrument. It corresponds, in this paper, to the Upper Limit of the Federal Funds Target Range, which has been adjusted for US inflation. 2) Real interest rate (**IR**), which is calculated by deflating the three-month interbank rates for the GCC by its CPI, to reflect the true cost of funds to the borrower and the real yield to the lender. 3) Real non-oil GDP (**GDP**) for the GCC, which is used as a proxy for non-oil economic activity. 4) Money supply, which is reflected by the aggregate money supply (**M2**) for the GCC deflated by its CPI, to capture the concerns of central banks regarding the liquidity of the money market. 5) The real oil price (**Oil**), which is computed by deflating the Brent oil price in US dollars per barrel by the US CPI. The US data and the oil price are sourced from the economic databases of the Federal Reserve Bank of St. Louis (FRED), while the GCC data is sourced from the database of the GCC Statistical Center. All variables, except FFR and IR, were expressed in logarithms and found to be I(1) in log-level but stationary in differences according to the augmented Fickey-Fuller unit root test.

III.2. Model specification

A Threshold Structural Vector Autoregression (TSVAR) approach, introduced by Blake (2000), is used in this paper to examine the asymmetric reactions to US monetary policy shocks in the low and high oil prices regimes, defined by a boundary which is equal to a certain value of the threshold variable. The coefficients of the TSVAR system are specific to each regime, where the process within each regime can be described by a linear model. The TSVAR model can be defined as follows in this equation:

$$y_t = u^1 + A^1 y_t + \theta^1(L) y_{t-1} + (u^2 + A^2 y_t + \theta^2(L) y_{t-1}) I(c_{t-d} > \gamma) + v_t$$

where y_t is a (5x1) vector containing the endogenous variables (ΔOil_t, ΔFFR_t, $\Delta M2_t$, ΔIR_t, ΔGDP_t), $\theta^1(L)$ and $\theta^2(L)$ are lag polynomial matrix, and I is an indicator variable which takes the value 1 if the d-lagged value of the threshold variable c_{t-d} (The real oil price in our case) is higher than the threshold critical value γ and 0 otherwise. The existence of the indicator variable *I* in the TSVAR model ensures the separation of the two regimes and allows both regimes to switch endogenously. A^1 and A^2 capture the structural simultaneous relationship in the high uncertainty regime and the low uncertainty regime, respectively. Given that the threshold value γ is not predetermined, we further use the non-standard inference test procedure of Afonso et al. (2011) to estimate the threshold value endogenously. The estimation procedure of the TSVAR model is first implemented using OLS for all possible value of *γ*. For each of the considered potential threshold value, the null hypothesis of no threshold effect is computed using the Wald statistic. The procedure consists of computing three test statistics namely: the sup-Wald (the maximum value of the Wald-statistic), the avg-Wald (the average of the Wald-statistic), and the exp-Wald (the sum of the exponential Wald-statistic). If the alternative of a TSVAR model is accepted, it is then possible to assess the appropriateness of switching regime. The resulting nonlinear impulse response functions (NIRF's) conditioned by uncertainty are supposed to detect the asymmetric behavior of the considered economic dynamics; the NIRF's are supposed to capture whether or not the size, sign, persistence, and propagation of a shock vary considerably when switching from one regime to another.

It is worth noting that the ordering of the variables is critical in TSVAR specification. Accordingly, the variables that are more exogenous come earlier in the system, and the ones that are endogenous appear later. It means that the variables that come earlier affect the following variables both contemporaneously and with a lag, while the variables that come later impact previous variables with a lag. Following the Cholesky identification procedure, the oil price (**Oil**) is ordered first, followed by the real Federal Funds Rate (**FFR**). We also assume that the GCC variables are ordered after, because it is unlikely that the macroeconomic situation of the GCC contemporaneously affects the US. Then, the monetary aggregate (**M2**) is ordered first, followed by the real interest rate (**IR**) and Real non-oil GDP (**GDP**). In fact, oil prices affect liquidity in the GCC, which in turn affects the interbank rates for the GCC.

IV. Empirical Results

Having checked the integration properties of the variables, we proceed then to the estimation of the TSVAR model, using two different threshold variables. The first one is US real policy rate (FFR) while the second one is the real brent oil price. This estimation is performed by setting the lag length to 1 based on Akaike's information criterion (AIC).

IV.1 US policy rate threshold

In terms of the nonlinear test and estimation of the model, the real Federal Funds Rate is used as the threshold variable, represented by FFR. The delay lag of the threshold variable d is set at 1. The number of bootstraps is set as 500 and the percentage of buffer period is set as 15%. Table 1 shows the result of the threshold test. The test indicates strong evidence of threshold effects for FFR since all kinds of Wald statistics are extremely significant. It also shows that the estimated threshold value is -0.8027, which is equivalent to an US interest rate of 2.25%. This estimated threshold value divides the data, resulting in 19 observations in the high regime and 43 observations in the low regime.

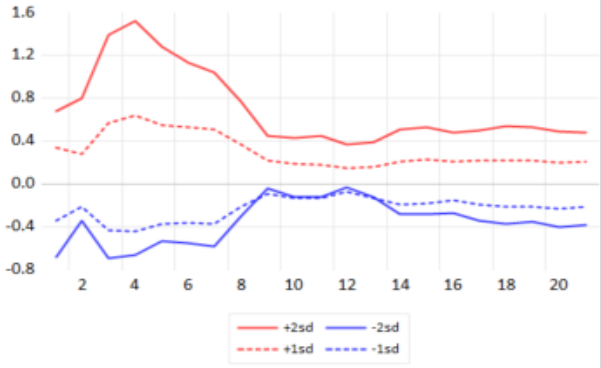
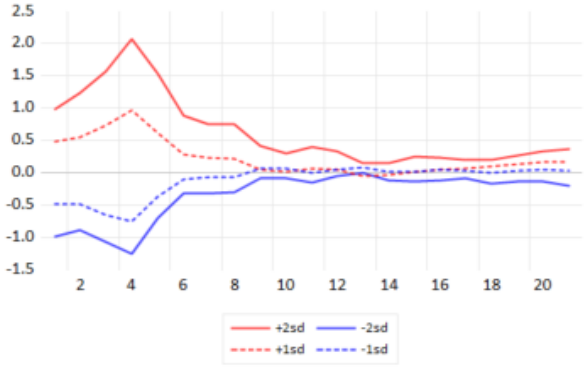
Table 1: FFR Threshold estimate

Threshold Variable	Estimated Threshold	Sup-Wald Statistic	Avg-Wald Statistic	Exp-Wald Statistic	Obs. in High regime	Obs. in Low regime
FFR	$\hat{\gamma}$ =- 0.802704	259.54 (0.000)	220.48 (0.000)	127.76 (0.000)	19	43

Note: Values in brackets are P-values. The delay parameter is set to 1 following Balke (2000) and each regime is restricted to contain at least 15% of the total observations.

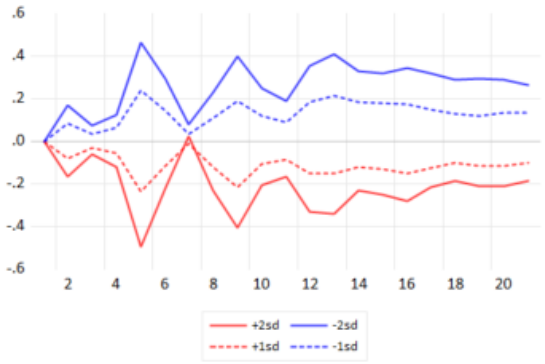
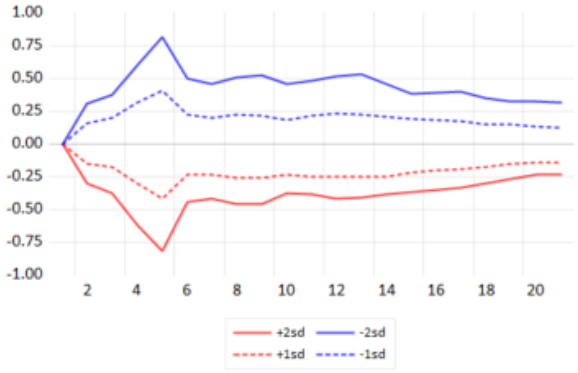
The threshold value of -0.8027 shows that the TSVAR model behaves differently when the real Federal Funds Rate (FFR) is above or below this point. This number is significant because it gives us important insights into how US monetary policy affects the GCC region. After estimating the threshold value of the model, the generalized impulse response functions (GIRFs) are constructed under High (above the FFR Threshold) and low (below the FFR Threshold) regimes. Both positive and negative monetary policy shocks are shown on the graphs below (see Charts 1-6). +2sd and +1sd (red lines) are the +2 and +1 standard deviation shocks, while -2sd and -1sd (blue lines) are -2 and -1 standard deviation shocks. It is worth mentioning that the effects of the shocks are not guaranteed to be symmetric.

There are some interesting insights according to our results. All the GIRFs charts below show that the response dynamics and sizes differ widely across regimes. This implies the significance of the estimated threshold value and confirms the existence of an asymmetric relationship between the US monetary policy and GCC economies. Charts 1 & 2 highlight that the spillover effects of U.S monetary policy on GCC interbank rates are generally positive but exhibit different dynamics depending on regimes. In fact, a hike in US interest rate has a stronger positive impact on GCC rates in the short term under the high regime (Chart 2) compared to under the low regime (Chart 1). This indicates that the transmission of U.S. monetary policy to domestic retail rates is relatively weak when US policy rates are below 2.25%. In this scenario, banks tend to delay raising their rates to remain competitive, especially while the cost of borrowing remains manageable. However, once U.S. policy rates exceed 2.25%, banks are more likely to pass on increased costs to borrowers to sustain profitability. Also, the positive shocks impose a larger effect on GCC rates than the negative shocks in both regimes. This suggests that lowering interest rates can significantly compress banks' profit margins, particularly on loans. As a result, banks may prioritize preserving their earnings over rapidly passing on rate cuts to consumers.

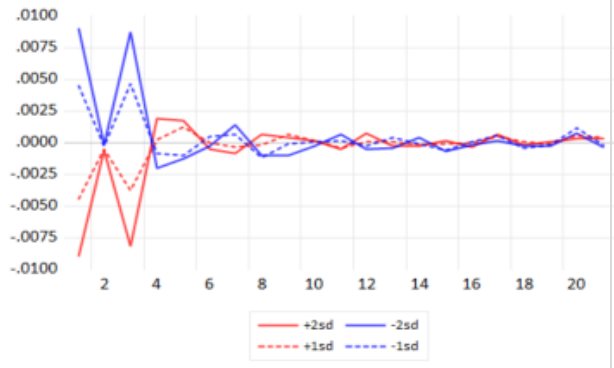
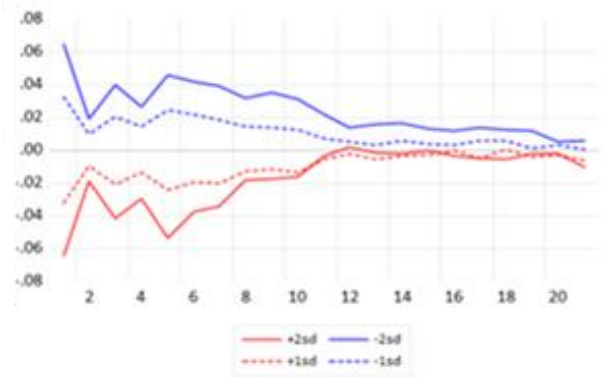
Low regime of FFR	High regime of FFR
Chart 1: Response of GCC Interbank rate to FFR	**Chart 2: Response of GCC Interbank rate to FFR**
	

To better understand the reaction of GCC interbank rates to FFR under both regimes, this paper focuses also on response of GCC Interbank rate to M2. In fact, the excesses (or shortage) of liquidity could potentially dampen (or amplify) the transmission of US monetary policy to GCC rates. This is confirmed by the results of charts 3 & 4 that show that an increase in M2 has led to a decline in domestic rates, while lower liquidity pushed rates up. In more detail, during the low regime (Chart 3), the response of GCC interbank rates remains volatile and limited, while under the

high regime (Chart 4), it stays steady and at a consistently elevated level. This can be attributed to the fact that banks may postpone passing on rate increases when they can secure funding at lower costs, particularly in environments with lower policy rates or excess liquidity.

Low regime of real FFR	High regime of real FFR
Chart 3: Response of GCC Interbank rate to M2	**Chart 4: Response of GCC Interbank rate to M2**
	

After outlining the influence of US interest rate levels and liquidity on US monetary policy shocks, Charts 5 and 6 examine the response of GCC GDP to changes in the real Federal Funds Rate (FFR). In the low regime of the FFR (chart 5), GDP reactions are very limited and volatile in the short term in response to both positive and negative shocks, with these effects diminishing over the medium to long term. This might imply a lack of effective transmission channels or a lower sensitivity of the economy to monetary policy when US interest rate is below 2.25%, which aligns with findings from earlier GIRFs (see Charts 1-4). However, both shocks have an immediate and significant impact on GCC GDP in the short term under the high-interest rate regime (chart 6), although their effects tend to dissipate over the long run. This suggests that the economy is more responsive to monetary policy changes during periods of elevated interest rates, as banks are more likely to pass these rate changes on to consumers.

Low regime of real FFR	High regime of real FFR
Chart 5: Response of GCC GDP to FFR	**Chart 6: Response of GCC GDP to FFR**
	

IV.2 Oil price threshold

To assess the robustness of our previous findings, we re-run our TSVAR model, this time using real oil prices as the threshold variable. Given the significance of the oil sector in the GCC, oil prices are a key driver of liquidity and may consequently influence the spillover effects of U.S. monetary policy on the region.

Table 2 reports the empirical results of the estimated threshold value and the test results of a linear VAR model against the alternative of the threshold SVAR model. According to the results reported in Table 2, the p-values of 0.00 associated with the three tests statistics (Sup-Wald, Avg-Wald, and Exp-Wald) reflect strong evidence of support of the TSVAR against linearity. The threshold value is estimated at -0.0165, which is equivalent to a Brent oil price of $72.3 per barrel. This estimated threshold value splits up the data, resulting in 35 observations in the high regime and 27 observations in the low regime.

Table 2: Oil Threshold estimate

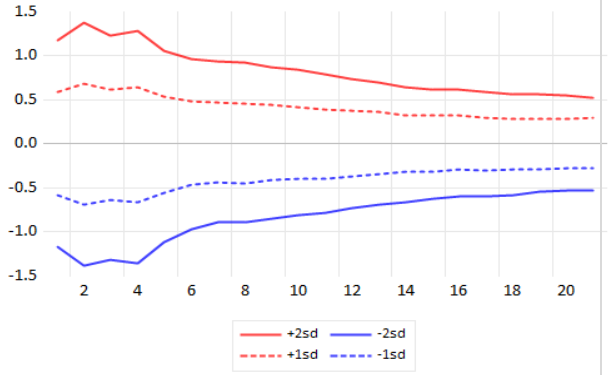
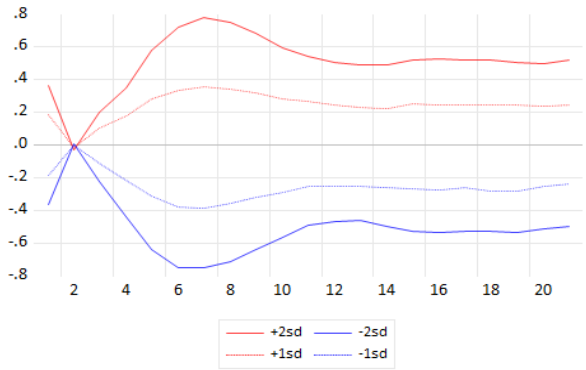
Threshold Variable	Estimated Threshold	Sup-Wald Statistic	Avg-Wald Statistic	Exp-Wald Statistic	Obs. in High regime	Obs. in Low regime
Oil	$\hat{\gamma}$=-0.0165	161.95 (0.000)	145.52 (0.000)	78,72 (0.000)	35	27

Note: Values in brackets are P-values. The delay parameter is set to 1 following Balke (2000) and each regime is restricted to contain at least 15% of the total observations.

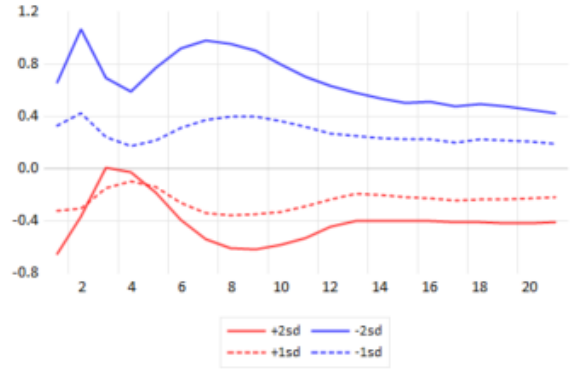
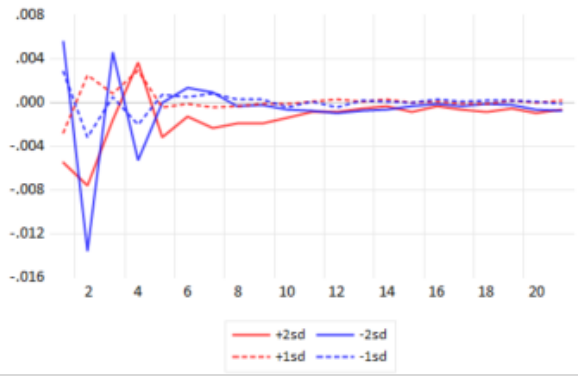
After estimating the model's threshold value, we constructed the GIRFs for both low and high regimes. The graphs (see Figures 7-12 below) display the effects of both positive and negative

monetary policy shocks across these two regimes of real oil prices. Consistent with earlier findings, all GIRF charts confirm the existence of an asymmetric relationship between U.S. monetary policy and GCC economies.

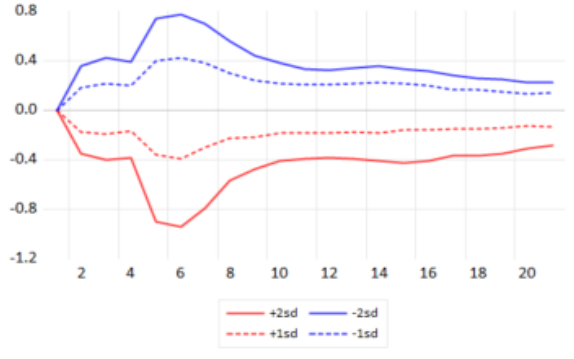
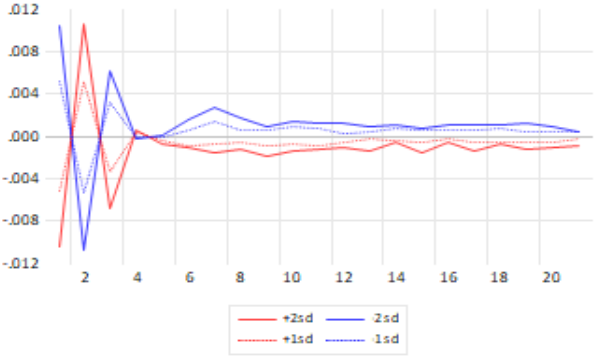
Charts 7 & 8 highlight an obvious difference in the response of GCC Interbank rate to real FFR under the high and low regimes. When oil price is below the estimated threshold (chart 7), a hike in US interest rate seems to increase immediately domestic interest rates in the GCC region, before decelerating in the long run but remaining at an elevated rate. However, FFR shocks dissipate rapidly in the second quarter under the high regime of real oil prices, as GCC interbank rates gradually rise and stabilize over the long term.

Low regime of real oil price	High regime of real oil price
Chart 7: Response of GCC Interbank rate to FFR	**Chart 8: Response of GCC Interbank rate to FFR**
	

Similar to the previous analysis (Charts 3 & 4) on the response of GCC Interbank rate to M2 under both FFR regimes, charts 9 & 10 focus on how interest rates behave when the real oil price is above or below the estimated threshold. In fact, a decrease in M2 leads in general to higher interest rates in the GCC region under the low regime of oil price, whereas there is no evidence of a significant impact from changes in M2 under the high regime. This may be attributed to excess liquidity during periods of high oil prices, resulting in abundant funding at lower costs for banks that prefer to maintain manageable interest rates regardless of changes in the FFR.

Low regime of real oil price	High regime of real oil price
Chart 9: Response of GCC Interbank rate to M2	**Chart 10: Response of GCC Interbank rate to M2**
	

In the low regime of the real oil price, both positive and negative shocks have a gradual and significant impact on GCC GDP in the short term (chart 11), although their effects tend to dissipate over the long run. This suggests that the economy is more responsive to monetary policy changes during periods of low oil prices, as banks are more likely to pass these rate changes on to consumers in an environment of liquidity shortage. However, GDP reactions are very limited and volatile in the short term in response to both positive and negative shocks, with these effects diminishing over the medium to long term. This highlights a lower sensitivity of the GCC economy to US monetary policy when oil price is above $72.3 per barrel, which is consistent with findings from earlier GIRFs (see Charts 5 & 6).

Low regime of real oil price	High regime of real oil price
Chart 11: Response of GCC GDP to FFR	**Chart 12: Response of GCC GDP to FFR**
	

V. Conclusion

Given the results of our analysis, this paper suggests some policy insights for the GCC region on US monetary policy spillovers. *First*, these findings reveal a highly conditional and non-linear transmission mechanism for US monetary policy in the GCC. Consequently, effective domestic policy responses must abandon a one-size-fits-all approach and adopt context-dependent non-linear policy tools tailored to specific economic conditions, particularly oil price levels and the US interest rate regime. *Second*, when the US Fed funds rate is high and oil prices are low, GCC Central Banks could use their other tools (like required reserve ratios or targeted lending directives) to maintain sufficient liquidity for productive non-oil sectors to counteract the restrictive effects of the internationally driven rate hike. *Third*, the most critical finding is that the adverse spillover of higher US interest rates is only felt when oil prices are below $72.3 per barrel. Since the dollar peg constrains GCC monetary policy, fiscal policy is the only effective tool for stabilization - another reason to highlight the importance of adopting a Counter-Cyclical Fiscal Strategy in the GCC. *Finally*, countries should continue developing deep and liquid local-currency bond and equity markets to provide alternative funding sources for non-oil businesses, making them less dependent on the interest rate pass-through dictated by the dollar peg.

References:

Espinoza, Raphael and Ananthakrishnan Prasad. 2012. "Monetary Policy Transmission in the GCC Countries" IMF Working Paper WP/12/132 (Washington: International Monetary Fund).

Chinn, Menzie D et al. (2013), "Global spillovers and domestic monetary policy", Technical report, Bank for International Settlements.

Balke, N.S., 2000. "Credit and economic activity: credit regimes and nonlinear propagation of shocks". Rev. Econ. Stat. 344–349.

Araujo, T. (2017). "Does Lowering the Interest Rate Stimulate Economic Growth? An Analysis of Current Macroeconomic Policy". Honors in the Major Theses, 206. University of Central Florida.

Al Raisi, A.H., S. Pattanaik, and A.Y. Al Raisi (2007). "Transmission mechanism of monetary policy under the fixed exchange rate regime of Oman". CBO occasional paper, 2007.1.

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).

Forni, M., Sala, L., Gambetti, L., & Debortoli, D. (2020). "Asymmetric Effects of Monetary Policy Easing and Tightening",

Saungweme, T., Maluleke, G., & Odhiambo, N. M. (2025). "Asymmetric Impact of Interest Rate on Economic Growth in Kenya", Finance, Accounting and Business Analysis (FABA). 7, 1.

Boufateh, T., 2019. "The environmental Kuznets curve by considering asymmetric oil price shocks: evidence from the top two". Environ. Sci. Pollut. Control Ser. 26 (1), 706–720. https://doi.org/10.1007/s11356-018-3641-3.

Afonso, A., Baxa, J., Slavik, M., 2011. "Fiscal Developments and Financial Stress, a Threshold VAR Analysis". European Central Bank.

Fleming, J.M. (1962), "Domestic Financial Policies under Fixed and Floating Exchange Rates", IMF Staff Papers 9, 369-379.

Haberis, Alex and Lipinska, Anna. (2012). `International policy spillovers at the zero lower bound', Bank of England Quarterly Bulletin 52(4), 365.

Aleem, A., & Lahiani, A. (2014). "A threshold vector autoregression model of exchange rate pass-through in Mexico". Research in International Business and Finance, 30, 24–33.

Zhuang, Jia. (2009). 'The empirical study according the spillover effects of U.S monetary policy on China", PhD Thesis, Fudan University, Shanghai, China.