

Oil Price Volatility, Islamic Finance, and Economic Growth in GCC countries

Kaouther Gazdar, Ph.D.

M. Kabir Hassan, Ph.D.

M. Kabir Hassan, Ph.D. (Corresponding Author)
2016 IDB Laureate in Islamic Banking and Finance
Professor of Finance and
Hibernia Professor of Economics and Finance and
Bank One Professor in Business
Department of Economics and Finance
University of New Orleans
New Orleans, LA 70148
Email: mhassan@uno.edu
Email: KabirHassan63@gmail.com
Office Phone: 504-280-6163
Cell Phone: 610-529-1247

Abstract

The purpose of this paper is to investigate whether a well-developed Islamic financial system can dampen the negative effect of oil volatility on economic growth in Gulf Cooperation Council (GCC) countries. To this end, we use a sample of 5 GCC countries over the period of 1996-2014. Our empirical findings provide evidence that there is a negative relationship between oil volatility and economic growth and that this negative relationship can be mitigated by a developed Islamic financial system.

I- Introduction

While they display some significant differences, Gulf Cooperation Council (GCC) countries also share a number of key specific structural economic features. One of the key common features is a high dependency on hydrocarbons, as expressed in the share of oil (and gas) revenues in total fiscal and export revenues as well as the share of the hydrocarbon sector in GDP. In fact, Khandelwal et al. (2016) argue that during 2011–14, hydrocarbon exports represented about 70 percent of total exports of goods and services on average in GCC countries. Fiscal dependence on hydrocarbon revenues was even greater, accounting for over 80 percent of total fiscal revenues on average.

Therefore, GCC countries are especially exposed to any movement in oil price, causing more volatility in their economic activity and resulting in uncertain economic growth (Al Khoury and Dhade 2014). For example, Moody's forecasts a deficit of 15.1 percent of GDP for Oman, three percent for Kuwait, and 5.5 percent for Qatar in 2016.

The high uncertainty in oil price movement, and consequently in oil revenues, induces GCC countries to tackle the question of what measures must be taken in order to effectively confront oil price volatility and maintain sustainable economic development.

The aim of this paper is to examine whether Islamic finance development can diminish the impact of oil volatility on economic growth in GCC countries. In fact, the Islamic financial system in GCC countries has evolved into a viable and competitive component of the overall financial system as a driver of economic growth and development. Each GCC country has built up comprehensive Islamic financial infrastructures. According to IFSI (2016), as of 2015 the Saudi Islamic banking sector was nearly one-half the size of the domestic banking sector, accounting for 49% of total banking sector assets; the other two major markets with large domestic shares were Kuwait and Qatar, with almost 39% and 26% shares, respectively.

More precisely, this paper tries to investigate whether the effect of volatility of oil terms of trade on economic growth depends on the degree of Islamic finance development in GCC countries. To this end, we consider a sample of 5 GCC countries and five-year non-overlapping observations between 1996 and 2014. Our empirical results confirm a robust negative relationship between oil terms of trade volatility and economic growth. Additionally, we find strong evidence that Islamic finance development can dampen the negative effect of volatility of oil terms of trade on economic growth.

The remainder of this paper is organized as follows. Section 2 reviews the literature, Section 3 describes the data and econometric model, Section 4 provides empirical results, and Section 5 summarizes our paper.

II- Literature Review

Our work builds on three different strands of literature. First, we build on the large theoretical and empirical literature on the relationship between volatility and economic growth. This strand of literature goes back to the seminal contribution of Ramey and Ramey (1995), who present empirical evidence against the standard dichotomy in macroeconomics that separates growth from the volatility of economic fluctuations. Using a panel of 92 countries, as well as a subset of OECD countries, Ramey and Ramey (1995) provide empirical evidence that countries with higher volatility have lower mean growth, even after controlling for other country-specific growth correlates. To examine the impact of the level and volatility of terms of trade and real effective exchange rate on investment and growth, Bleaney and Grenaway (2001) consider a sample of 14 Sub-Saharan African countries over 1980-1995. The results of their estimations show that growth is negatively affected by terms of trade instability, and investment by real exchange rate instability. Blatman et al. (2007) examine the effect of terms of trade volatility arising from excessive commodity price fluctuations on the growth performance for a sample of 35 countries from 1870 to 1939. Their findings show that that some commodities proved more volatile in price than others, and those countries with more volatile commodities have grown more slowly than other commodity-specialized nations.

A second relevant strand of literature has studied the effect of financial development in the volatility-growth relationship. Easterly et al. (2000) provide evidence that the financial system generally acts as a stabilizer and reduces growth volatility. Denizer et al. (2000) investigate the role played by finance in propagating and dampening macroeconomic fluctuations. Considering a panel of 70 countries over 1956-1998, they provide two important findings: (i) countries with more developed financial systems experience less fluctuations in output and (ii) private sector finance is particularly important in reducing macroeconomic volatility. The latest results are in line with the findings of Raddatz (2006), who provides evidence that financial development has a large causal effect on the reduction of macroeconomic volatility resulting from the role of the financial system in liquidity provision. Aghion et al. (2009) test the hypothesis that exchange rate volatility has a negative impact on (long-run) growth when countries are less developed financially. Based on a dynamic panel of 83 countries over the period 1960–2000, Aghion et al. (2009) provide evidence that higher levels of excess exchange rate volatility can stunt growth, especially in countries with thin capital markets where financial shocks are the main source of macroeconomic volatility. Rodriguez (2014) analyzes how fiscal policies and credit constraints can affect the impact of macroeconomic volatility on long-run growth. Rodriguez finds that (i) the negative impact of volatility on economic growth is exacerbated by financial underdevelopment and (ii) in financially underdeveloped economies countercyclical fiscal policy reduces the negative impact that volatility has on economic growth. In a more recent study, Brüeckner and Carneiro (2015) investigate the effects of terms of trade volatility on the growth of real GDP per capita. Based on a sample of 175 countries over the period 1980-2010, they find that countercyclical fiscal policy and deeper financial markets have particularly high payoffs in reducing the adverse growth effects of terms of trade volatility in the Organization of Eastern Caribbean States region.

Most closely related in motivation to our paper are Beck et al. (2006), van der Ploeg and Poelhekke (2009), and Moradbeigi and Law (2016).

To explore the potential channels through which financial development helps decrease growth volatility, Beck et al. (2006) have developed a theoretical model that is a simplified version of a model developed by Bacchetta and Caminal (2000). The Beck et al. (2006) theoretical model shows that financial development can dampen the effect of shocks on growth volatility, depending on the nature of the shocks. To test their theoretical hypothesis, Beck et al. (2006) consider a sample of 63 countries over the period 1960-1997. Their empirical findings support their theoretical predictions. In fact, they provide empirical evidence that a higher level of financial development dampens the positive effect of the volatility of terms of trade changes on economic volatility, especially in high-income countries, while it magnifies the impact of inflation volatility in non-high income countries. In the same vein, van der Ploeg and Poelhekke (2009) provide cross country evidence that the resource curse is less pronounced in the presence of well-developed financial sectors.

Moradbeigi and Law (2016) investigate the impact of oil terms of trade growth volatility on growth volatility and assess the role of financial development as a potential channel through which the two variables mentioned earlier might be linked. The estimation results for two panels of 63 and 61 countries over the period of 1981-2010 confirm a negative link between the volatility of oil terms of trade and growth. However, they also find weak evidence that financial development dampens the effect of oil terms of trade volatility. Our contribution consists of examining the effect of Islamic finance development in the oil terms of trade volatility-growth relationship. In fact, while the studies cited above have examined the role of financial development in the volatility-growth relationship, to the best of our knowledge none of them has examined the role of Islamic finance.

III- Data and Econometric Methods

In this section we describe the data and econometric methods used to test whether the impact of oil terms of trade growth volatility (OTOT) on economic growth in five GCC countries is amplified or diminished by Islamic financial development.

III-1- Data

We use a sample of 5 GCC¹ countries over the period 1996-2014.

III-1-a- Oil Terms of Trade

Our country-specific measure for the OTOT index is from Spatafora and Tytell (2009) and is defined as follows:

$$OTOT_{i,t} = \left(\frac{POIL_t}{MUV_t} \right)^{X_i - M_i} (1)$$

Where $POIL_t$ is the yearly price of oil for the period 1996-2014, MUV_t is a manufacturing unit value index, and X_i and M_i are the average share of export and import in the countries to their GDP ratio between 1996-2014. The OTOT index allows countries to be influenced by

¹ Saudia Arabia, Qatar, Kuwait, UAE, and Bahrain

changes in oil prices differently, depending on the composition of their oil export and import basket.

To calculate TOT growth, we first take the logarithm of (1)

$$\ln OTOT_{i,t} = (X_i - M_i) \ln \frac{POIL_t}{MUV_t} \quad (2)$$

Taking the difference of (2), we obtain the annual growth rate of the OTOT index:

$$g_{OTOT_{i,t}} = \ln OTOT_{i,t} - \ln OTOT_{i,t-1} \quad (3)$$

This equation reflects the change in real oil prices in country i scaled by the importance of oil in the net exports of the country ($X_i - M_i$).

In order to construct the volatility in oil terms of trade growth, the five-year non-overlapping of oil standard deviation of the growth rate of oil terms of trade index, $g_{OTOT_{i,t}}$ is constructed below

$$SD(OTOT)_{it,t+s} = \sqrt{\frac{1}{S} \sum_{s=0}^S \left(g_{OTOT_{it+s}} - \frac{1}{S+1} \sum_{s=0}^S g_{OTOT_{it+s}} \right)^2} \quad (4)$$

As the five-year non-overlapping standard deviation is considered here, S equals four (S=4).

III-1-b- Islamic Financial Indicators

As a measure of Islamic finance development we use indicators of financial intermediary development. Two indicators are considered:

- i) **Islamic financial depth:** to measure Islamic financial depth we consider the most common variable being used in today's literature, which is Islamic financial assets (financial intermediary credit to the private sector) divided by Gross Domestic Product (GDP) and is measured over the period 1996-2014. For most countries, this variable is not available.
- ii) **Islamic financial concentration:** equals Islamic banking assets divided by total banking assets.

III-2- Econometric Methodology

The main objective of this paper is to test the hypotheses that: (i) an increase in oil terms of trade growth volatility has a negative effect on GDP economic growth and (ii) Islamic financial development dampens the negative effect of oil terms of trade growth volatility on economic growth. To test these hypotheses, we estimated the following model:

$$GROWTH_{it} = \beta_0 SD(OTOT)_{it} + \beta_1 IFD_{it} + \beta_2 (IFD_{it} * SD(OTOT)_{it}) + \alpha Z_{it} + \epsilon_i + \theta_t + \mu_{it} \quad (5)$$

Where $GROWTH_{it}$ is the real GDP per capita growth; $SD(OTOT)_{it}$ is the five-year non-overlapping standard deviation of oil terms of trade growth; IFD_{it} denotes the measure of Islamic finance development; $(IFD_{it} * SD(OTOT)_{it})$ is an interactive variable between Islamic finance development and oil terms of trade volatility; Z_{it} is a set of four control variables, namely (i) initial level of development (IIC) which equals the logarithm of initial income per capita and will provide evidence of any convergence effects; (ii) trade openness (TO), proxied by the ratio of the sum of exports and imports to GDP, since the empirical growth literature has shown that openness to international trade is an important determinant of economic growth; (iii) government consumption (GC) where we control for the level of government consumption by using the ratio of government consumption to GDP; and (iv) inflation (INF) proxied by the annual inflation rate, which is included as an indicator for macroeconomic stability; ϵ_i is a country fixed effect; θ_t is the time fixed effect which captures common shocks that affect GDP per capita growth in a given time period; and μ_{it} is the disturbance term.

Equation (5) permits us to assess whether oil terms of trade volatility has a different influence on growth in countries with high values of Islamic financial development than it does in countries with low values. In this specification, the responsiveness of the steady state level of economic growth to oil terms of trade volatility is δ (equation 6). Specifically, differentiate equation (5) with respect to volatility to obtain the marginal effect of oil terms of trade volatility on economic growth:

$$\delta = \frac{\partial GROWTH}{\partial SD(OTOT)} = \beta_0 + \beta_2 * IFD_{i,t} \quad (6)$$

Our conditional hypothesis centers around the coefficients β_0 and β_2 . Our hypothesis implies

- If ($\beta_0 < 0$ and $\beta_2 > 0$), an increase in oil terms of trade growth volatility has a negative effect on GDP economic growth and Islamic financial development hampers the negative effect of oil terms of trade growth volatility on economic growth.

To estimate our model, we considered fixed effects as well as random effects in this study. We used the Hausman test to select the appropriate estimator. Table 1 in the Appendix provides a list of the variables used in the econometric analysis and their data sources. The summary statistics and correlation matrix are presented in Tables 2 and 3 respectively.

IV- Empirical Results

Table 4 reports the results of our estimation of the regressions on the link between economic growth and oil terms of trade growth volatility for our sample of 5 GCC countries between 1996 and 2014. The first set of results (Model 1, Table 4) presents the specification without the interactive variable. Our main findings show that the oil terms of trade volatility has a negative and significant effect on economic growth in GCC countries. These results are in line with Ramey and Ramey (1995) and Bleaney and Grenaway (2001) who have provided empirical evidence that countries with higher volatility have lower mean growth.

Model 2 (Table 4) reports the results of regressions analyzing the effect of Islamic finance development (IFD) on the relationship between oil terms of trade growth volatility and economic growth. When we consider the Islamic asset to GDP ratio as the indicator of Islamic finance development, the estimated results show that while the indicator of oil terms of trade growth volatility remains significantly negative, the additional interaction variable (SDOTOT*IFD) is significantly positive, suggesting that Islamic finance development may very well mitigate the negative effect of oil terms of trade growth volatility. These results are in line with the theoretical model of Beck et al. (2006) which has shown that financial development can dampen or magnify the effect of shocks on growth volatility.

When we consider the Islamic assets to total assets ratio to be the indicator of Islamic finance development, (Model 3, Table 4) the first interesting discovery is that in terms of significance, these results are consistent with our findings when we use the Islamic assets to GDP ratio. In fact, while the oil terms of trade growth volatility remains significantly negative, the interactive variable appears significant with a positive sign.

As expected, the two indicators of Islamic finance development have a positive and significant effect on economic growth.

In summary, our findings imply that while an increase in the oil terms of trade growth volatility decreases growth, the negative effect is reduced in more developed Islamic financial systems. Therefore, a more developed Islamic financial system is likely to help countries deal better with oil terms of trade growth volatility (Moradbeigi and Hook Law 2016)

Looking to the control variables, we find that the coefficients of the initial level of development (IIC) have an expected significant negative sign in most regressions. This result supports Barro (1991)'s proposition that poor countries tend to grow more rapidly than rich countries. While it is not significant in all regressions, the government consumption ratio enters in most regressions significantly and with a negative sign, confirming the theoretical expectations. Inflation and trade openness appear not significant in our estimations.

V- Conclusion

This paper examines (i) the effect of oil terms of trade growth volatility on economic growth in GCC countries and (ii) whether a developed Islamic financial system can moderate the negative effect of oil terms of trade growth volatility on economic growth. Considering a sample of 5 GCC countries over the period of 1996-2014, our findings provide empirical evidence that oil terms of trade growth volatility has a negative effect on economic growth and a well-developed Islamic financial system can mitigate this effect.

Our findings present strong policy implications. GCC countries can improve their economic growth by improving the performance of their Islamic financial system. In fact, as argued by Moradbeigi and Law (2016), a better financial system decreases uncertainty among households and firms and increases government credibility, thus enhancing the positive effects of oil resources on growth by channeling revenues into more productive activities.

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APPENDIX

Table 1: Definitions and Sources of Variables

Variable	Definition	Source
GDP Growth	Real GDP per capita growth	World Bank, The World Development Indicators (WDI 2016)
Islamic Financial Development	<ul style="list-style-type: none"> - Islamic financial assets (financial intermediary credit to the private sector) divided by Gross Domestic Product (GDP) - Islamic banking assets divided by total banking assets 	Author's calculation based on Bank reports
Oil Terms of Trade Growth volatility	Standard deviation of real GDP per capita Growth in five-year interval	Author's construction based on Spatafora and Tytell (2009)
Real GDP per capita	Ratio of GDP to population	World Bank, The World Development Indicators (WDI 2016)
Trade Openness	Ratio of exports and Imports to GDP	World Bank, The World Development Indicators (WDI 2016)
Government expenditure	Ratio of Government consumption to GDP	World Bank, The World Development Indicators (WDI 2016)
Inflation	The annual inflation rate	World Bank, The World Development Indicators (WDI 2016)

Table 2: Summary Statistics

Variable	Obs	Mean	St.Dev	Min	Max
Y	18	.18	3.01	-9.45	4.97
IIC	18	4.41	.23	4.08	4.79
GOVEX	18	17.89	6.09	7.21	27.93
INF	18	.63	.32	-.11	1.16
TO	18	101.4	23.87	63.15	143.76
SD(OTOT)	18	.13	.51	8.52e-10	2.27
IFD₁	18	25.11	20.60	1.59	73.20
IFD₂	18	46.41	34.26	5.52	107.07

Table 3: Correlation Matrix

Variable	1	2	3	4	5	6	7	8
(1)Y	1							
(2) IIC	-0.09	1						
(3)GOVEX	0.53	-0.53	1					
(4)INF	0.21	-0.02	0.06	1				
(5)TO	-0.51	0.021	-0.59	-0.71	1			
(6)(SD)OTOT	0.01	-0.39	0.35	0.25	-0.42	1		
(7)IFD ₁	0.32	-0.26	0.30	0.63	-0.52	-0.05	1	
(8)IFD ₂	-0.02	-0.52	-0.15	-0.12	0.52	-0.22	0.17	1

Table 4: Economic Growth, Oil price volatility and Islamic Finance development

Variables	(1) Benchmark Model	(2) IFD= Islamic Asset to GDP	(3) IFD= Islamic Asset to total Asset
IIC	-2.51* (-3.01)	-2.82 (-0.53)	-2.92 (-2.92)
GOVEX	-.13 (-1.80***)	-.22 (-0.70)	-.21 (-0.65)
INF	-2.07 (-0.57)	-3.59 (-0.86)	-3.33 (-0.80)
TO	.07 (1.08)	.10 (1.11)	.085 (1.05)
SD(OTOT)	-1.37** (-2.03)	-2.07*** (-1.80)	-2.81** (-2.17)
IFD ₁		.02 (.035)	
IFD ₂			.008 *** (1.79)
SD(OTOT)* IFD ₁		.29** (1.92)	
SD(OTOT)*IFD ₂			.14* (3.51)
cst	23.81 (0.78)	31.09 (0.79)	28.85 (0.75)
Hausman test	0.70 (RE)	0.85 (RE)	0.78 (RE)

Note: Panel estimations of 5 GCC countries. H-statistics correspond to Hausman test for comparison between fixed (FE) or random (RE) effects specifications. T-statistics for the coefficients are in parentheses. *significant at 1%, **significant at 5%, and ***significant at 10%.