The Impact of Oil Price on Economic Growth in Qatar (1980-2023)

Dr. May Issa Ali
mayissa56@gmail.com

Dr. Mizher Alhashimi
Malhashimi56@hotmail.com

Abstract

This study aimed to test the long-term relationship between global oil prices and economic growth in the State of Qatar (1980-2023). The ARDL methodology was used for testing. The results showed that the study variables are stable for the first difference. High oil prices have a positive impact on economic growth, as high Oil prices increasing by 1% contributes to increasing economic growth by the equivalent of 3.23%, and this confirms the role of oil revenues in Qatari economic growth.

Keywords: Oil price, Economic growth, Qatar.

Jel: Q43, C22

Introduction

The Qatari Ministry of Finance announced that the budget of the State of Qatar for the first quarter of 2023 achieved a surplus of 19.7 billion riyals ($5.41 billion). The figure reflects an increase of 70 percent compared to the fourth quarter of 2022, which witnessed a profit of 11.6 billion riyals.

The Ministry stated that "total revenues for this quarter amounted to 68.6 billion riyals, of which 63.4 billion riyals were oil and gas, while non-oil revenues amounted to 5.2 billion riyals."

They indicated that the total expenditures in the same quarter of 2023 amounted to 48.9 billion riyals, of which 15.6 billion riyals were for salaries and wages and 17.3 billion riyals for current expenses, while secondary capital expenditures amounted to one billion riyals and significant capital expenditures amounted to 15.1 billion riyals.

The data of the Ministry of Finance also indicated that the actual average oil price during the quarter mentioned above amounted to 82.2 dollars per barrel, which is higher than the estimated price in Qatar's budget for the year 2023, which is 65 dollars per barrel.

The Ministry's estimated data for the state's general budget for the year 2023 estimated the surplus at 29 billion riyals for the entire year 2023, which means that about 68% of this amount has already been achieved for the first quarter of 2023 only.

Today, the Qatari economy is one of the strongest economies in the region, and among the most promising economies globally. Over the past years, the State of Qatar has succeeded in consolidating its advanced position on the global economic map in accordance with the approach drawn by His Highness Sheikh Tamim bin Hamad Al Thani, Emir of the country - may God protect him - to continue the journey of achieving Qatar National Vision 2030 towards establishing a diversified and competitive economy based on knowledge and innovation. Realizing the importance of balancing its economic policies aimed at diversifying the national economy and enhancing its natural resources and wealth, Qatar’s non-oil revenues are expected to reach 43 billion riyals in 2024, an increase of about 2.4% compared to the 2023 fiscal year budget. The state has given the energy sector the necessary attention as an important source for expanding the base of the national economy by working to increase the production capacity of natural gas through the expansion of the North Field for natural gas, which will increase its production of liquefied natural gas by 46% to 126 million tons annually by 2027. These systematic economic policies have contributed to supporting all sectors of the state to become an effective partner in strengthening and supporting the national economy and enhancing investor confidence in it. The State of Qatar has also achieved great success in particular in diversifying the economic base by establishing many major economic projects related to the oil and gas industry, such as the aluminum industry and petrochemical industries, which have raised Qatar to the ranks of major producing countries in this industry. The development that has occurred in the petrochemical industries is a pioneering strategic step that contributes to diversifying

the industrial base in Qatar and developing supporting industries accompanying the basic industries with the aim of diversifying sources of income in the country and producing industrial products with added value that enhance the capabilities of the Qatari economy in global markets. The state has allocated huge investments amounting to billions of dollars to raise the State of Qatar's production to 23 million metric tons annually of various petrochemical products, especially urea, ethylene, polyethylene and melamine over the next few years. His Highness the Emir's directive to develop these projects and allocate additional amounts amounting to about 30 billion dollars is a strong confirmation and evidence of moving forward in developing these industries with well-studied and effective plans that make them integrated economic projects in terms of production, operation and export. The development in the oil and gas industry in Qatar has contributed to opening up broad horizons for the petrochemical industries. And related industries, as many experts confirm that the expansion projects in the petrochemical industries will make Qatar one of the top ten countries in the petrochemical industry in the world and will achieve huge revenues, which confirms the prominent role of the energy sector and related industries in supporting the state budget and in the development and prosperity of the Qatari economy.

The oil industries in the Middle East are considered one of the most important and prominent economic sectors in the world, as the largest crude oil reserves are located in this region. Historically, the discovery of oil in the Middle East dates back to the mid-nineteenth century, when the first oil fields were discovered in the Arabian Gulf region, starting from Bahrain to Kuwait, the Emirates, Saudi Arabia and other countries. With the development of the oil extraction industry, the Middle East has become a prominent role in the global energy market, as the Gulf Cooperation Council countries, including Saudi Arabia, the Emirates and Kuwait, are among the largest oil producers and exporters in the world. In addition, countries such as Iraq, Iran, Qatar and Oman also play an important role in the oil industry.

The impact of this industry on the economies of the Middle East is not limited to achieving huge financial revenues, but rather extends beyond that to social, political and economic impacts. For example, the oil industry provides huge job opportunities such as the infrastructure financing and services sector. As for the political impact, for example, financing infrastructure projects contributes to enhancing political and economic stability in improving relations between neighboring countries. Emphasizing its control over the global market and its importance in determining global oil policies.

However, the heavy dependence of national economies on oil makes them vulnerable to fluctuations in global oil prices and changes in global demand. At the global level, and what concerns investors when trading in foreign markets, is the extent to which the global oil market affects global economies. An increase in oil prices can lead to a slowdown in economic growth and increased inflation in many oil-consuming countries, while sharp declines in oil prices can lead to economic difficulties for producing countries.

Global demand for oil remains linked to improved global economic growth and developments in the economies of major countries such as China and the United States. Emerging markets may witness an increase in demand for oil as they develop and expand, which may enhance the importance of the crude oil industry in the future. In short, the future of the crude oil industry in the Middle East depends on developments in several factors, including technology, politics, the environment, global economies, and geopolitical and economic challenges. In my opinion, the role of crude oil in the Middle East economy will remain vital and central, despite the many challenges. It is important for Arab countries to adopt sustainable strategies to diversify their economies and rely on clean and renewable energy sources in addition to oil, in order to ensure sustainable development and achieve economic stability in the future. Achieving this goal requires international cooperation and investment in innovation and technology to improve production efficiency and preserve the environment, as well as enhance transparency and governance in the energy sector. In addition, Arab countries must cooperate to promote sustainable development and provide job and educational opportunities for young people, which will facilitate

The significance of study

The energy sector is considered one of the most important sectors of the Qatari economy. The revenues that Qatar receives annually from gas exceed $100 billion. These revenues constitute the main engine for Qatari economic growth, so measuring the impact of high oil prices on long-term growth is of great importance to the decision maker.

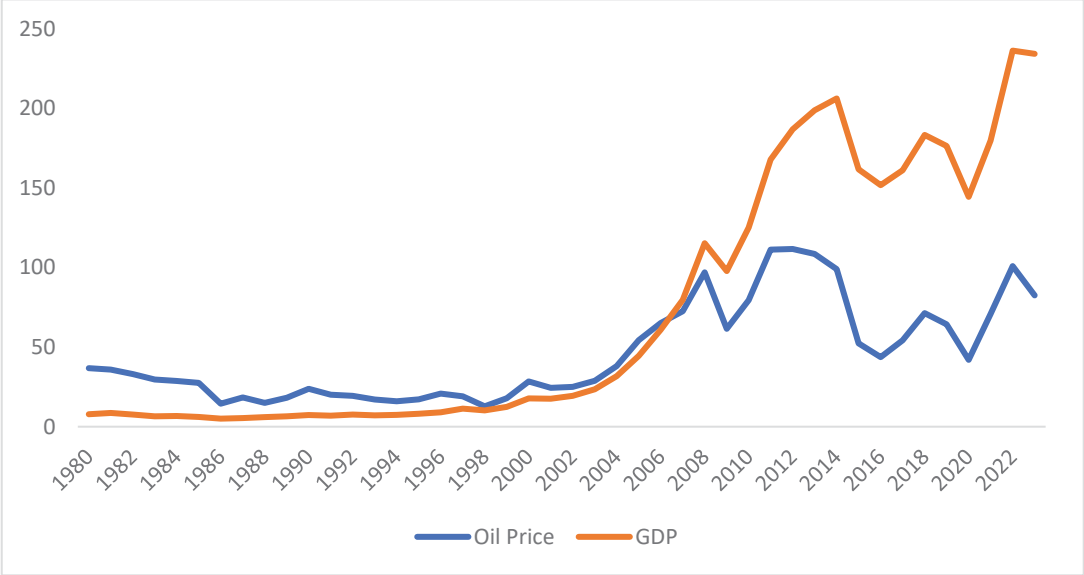
Study objective

This study aimed to identify the impact of global oil prices on Qatari economic growth during the period 1980-2023 by using the ARDL methodology.

Oil revenue and growth in Qatar

It is noted from Figure 1 that there is a strong correlation between the rise in oil prices and the Qatari GDP, and this clearly proves that oil revenues constitute one of the pillars of the Qatari economy. The State of Qatar, although it is not an oil exporter, is an exporter of natural gas, and the rise in global oil prices is reflected in the rise Gas This is what makes there a strong relationship between oil prices and gas prices.

Figure (1) The Development of Crude oil prices and economic growth in Qatar (1980-2023)



Source: www.worldbanak. Data.com

Literature review

Rumbia et al. (2022) This research aimed to examine the effect of crude oil prices and internet on economic growth in Timor Leste. An autoregressive distributed lag model was used to analyze the time series data from 2005 to 2020. The cointegration test results showed that crude oil prices, internet, and economic growth are cointegrated. Based on the model coefficients, the estimation results revealed crude oil prices and internet have a significant effect on the country's long-term and short-term economic growth. The long-term effect of crude oil prices on economic growth is negative. In every 1% increase of crude oil prices, there is a 10.3% decrease in economic growth. A 1% reduction in crude oil prices leads to a 10.3% economic growth. Furthermore, the long-term effect of the internet has a long-term positive effect on economic growth. Every 1% internet increase, there is a corresponding 27.65% increase in economic growth.

Using the ARDL model, Omitogun et al. (2018) examined the effect of crude oil prices on economic growth in Nigeria. The test results drawn from the years 1981 to 2016 revealed that crude oil prices have a significant long-term and short-term influence on the economic growth of a country. The long-term effects of crude oil prices on economic growth showed a positive correlation. Wen et al. (2018) used the TVP-VAR model to examine the effect of crude oil prices on economic growth in China. Based on the analysis of the results conducted every month from January 1996 to June 2017, there was a conclusion that the price of crude oil positively affects the economic growth of a country in the long run and short term. Using wavelet analysis, Mo et al. (2019) examined the effect of crude oil prices on economic growth in BRICS countries using quarterly data in 1996Q2-2018Q3. The data results analysis showed that crude oil prices

positively affect economic growth in each country (China, Brazil, Russia, South Africa, and India) in the long and short term.

Abbritti et al. (2020) examined the effect of crude oil prices on economic growth in the United States, and the results indicated that rising crude oil prices increase economic growth. Sadath and Acharya ,(2021)using annual data analysis from 1996 to 2017, tested the effect of crude oil price asymmetry in India with the assistance of the Structural Vector autoregressive model. The conclusion of the results showed that indeed crude oil price changes affect economic growth.

Kriskkumar et al. (2022) This paper attempts to investigate if the effect of oil price on growth is asymmetrical for Malaysia, a small-open-dynamic oil-exporting country, over a period from 1981 to 2017. The empirical method employed in this study is the augmented autoregressive distributed lag model (ARDL) bound test approach and the recent innovative nonlinear autoregressive distributed lag (NARDL) model. Results suggest that neglecting nonlinearities can lead to misleading results. More precisely, the result reveals that adjustments in the price of oil influence Malaysia's economic growth asymmetrically. An increase and decrease in the price of oil strengthen the economic growth of Malaysia, demonstrating Malaysia's ability to be both an oil producing country and a trading nation. These results strongly imply that Malaysia is able to take advantage of changes in the oil price efficiently.

Nusair (2016) This paper examines the effects of oil price shocks on the real GDP of the Gulf Cooperation Council (GCC) countries. The empirical method used is the nonlinear cointegrating autoregressive distributed lag (NARDL) model of Shin et al. (2013) in which short-run and long-run nonlinearities are introduced via positive and negative partial sum decompositions of the explanatory variable(s). The results suggest evidence of asymmetries in all the cases. We find significant positive oil price changes in all the cases with the expected positive sign, implying that increases in oil price lead to increases in real GDP. Conversely, negative oil price changes are significant for only Kuwait and Qatar with the expected positive sign, suggesting that decreases in oil price lead to decreases in their real GDP. Further analysis implemented using panel data shows that positive oil prices changes increase real GDP and negative changes decrease real GDP. Overall, the results suggest that positive oil price changes have a considerably larger impact on real GDP than negative changes.

Charfeddine and Barakat (2020) The aim of this paper is to explore the short- and long-run asymmetric impact of oil prices shocks and oil and gas revenues changes on the total real GDP, and the level of economic diversification of the Qatar economy. To this end, two econometric approaches have been used: (1) the A-B structural vector autoregressive (AB − SVARX) model with exogenous variables where four different asymmetric oil prices and oil and gas revenues measures have been employed, and (2) the nonlinear autoregressive distributed lag (NARDL) model. The results show that, in the short-run, the responses of both total real GDP and non-oil real GDP to negative shocks on real oil prices and real oil and gas revenues are higher than the impact of

positive shocks, indicating evidence for the existence of asymmetric impact of shocks in the short-run. However, the results suggest that the impact of shocks do not last more than three quarters. This evidence for the existence of asymmetric behavior is also confirmed by the NARDL analysis, which shows that, in the long-run, positive oil prices shocks and oil and gas revenues changes have higher impact on the two proxies of economic activity than negative changes do. A result that confirms the resilience of the Qatar economy to negative shocks and the positive role played by the energy sector in improving the Qatar economic diversification degree. Finally, the results show that the non-oil sector is completely resilient to negative shocks in the long-run as the impact of negative shocks are insignificant on the non-oil real GDP. Several policies aimed to improve the level of economic diversification of the country and delink the government revenues from oil and gas revenues are proposed and discussed.

Methodology

Autoregressive distributed lag (ARDL), developed by Pasaran et al. (2001), is used to clarify the long- and short-term relationships and test the validity of Thirlwall's law. This method differs from previous approaches in several ways, including the ability to determine the integrated relationship between the dependent and independent variables over the long and short terms, establish variables at different stationary levels, and, most importantly, eliminate autocorrelation.

Study model

Many researchers, such as El Anshasy and Bradley(2012), Hamdi and Sbia (2013), and Ozsagir et al. (2011), have pointed out that oil prices have a imperative impact on economic growth, especially in oil-exporting countries. Qatar is considered one of the leading countries in gas exports. The rise in oil prices is directly linked to the rise in gas prices. The equation (1) below shows that economic growth Qatar is affected by international oil prices.

$$GDP = F(P) \qquad (1)$$

$$\mathrm{GDP_{LR}} = \alpha + \rho \mathrm{P} + + \omega_{\mathrm{t}} \qquad (2)$$

$$\Delta \mathrm{GDP_{LR}} = \alpha + \sum_{i=1}^{m1} \pi \Delta \mathrm{GDPd}_{t-i} \sum_{i=0}^{m2} \rho \Delta \mathrm{P}_{t-i} + \delta_1 \mathrm{GDPd}_{t-1} + \delta_2 \mathrm{P}_{t-1} + \mathrm{v_t} \qquad (3)$$

Where GDP is Gross domestic product and LR for the long run, P is the Crude oil price, v_t is the classical regression error term.

The short-run dynamic adjustment process should be combined with the long-run joining in equation (3), according to recent economic literature. By expressing equation (4) in an error-correction model as described in Pesaran et al. (2001), it is possible to accomplish the goal of this work. In light of this, the cointegration strategy offers a few

methodological benefits over alternative single cointegration techniques. The primary benefit is that the ARDL method works regardless of whether the underlying regressors are mutually cointegrated, purely 1(0), or purely 1(1). The other key benefit of this strategy is that, as Narayan (2005) discusses, limits testing's small sample qualities are significantly superior to multivariate cointegration.

To examine whether variables move toward long-run equilibrium value adjustment, estimates of $\delta_1 - \delta_2$ are used to form an error-correction term (EC). Thus, lagged variables in Eq. (3) are changed by EC_{t-1} establishing a modified form of Eq. (4) as follows:

$$\Delta \mathrm{GDP}_{\mathrm{LR}} = \alpha + \sum_{i=1}^{m1} \pi \Delta \mathrm{GDPd}_{t-i} \sum_{i=0}^{m2} \rho \Delta \mathrm{P}_{t-i} + \delta_1 \mathrm{GDPd}_{t-1} + \delta_2 \mathrm{P}_{t-1} + \lambda EC_{t-1} + \mu_t \quad (4)$$

Where λ is the speed of adjustment parameter. A significant negative coefficient EC_{t-1} supports adjustment toward long-run equilibrium. This study depends on annual data from 1980-2023 for Qatar. That data is primarily collected from the World Bank database. Study variables are and gross domestic product and crude oil prices.

Empirical results

The findings of the bound test indicate the existence of a long-term association. This study used annual data with a sample size of 43 observations covering 1980–2023, and the maximum lag length in the ARDL was set to 1.

Because time series data frequently lacks a consistent trend and causes their means to fluctuate constantly, testing for the presence of a unit root is required to prevent erroneous results. The tests that were used were the Phillips-Perron test (PP), Phillips & Perron (1988), and the Augmented Dickey-Fuller (ADF), Dickey & Fuller (1979).

Table 1. Unit root results

Variables	***At level***		***First difference***	
	ADF Test	PP test	ADF Test	PP test
GDP	0.577	0.588	-5.456	-5.136
P	-1.405	-1.366	-5.989	-6.041

*** significance at 1%, 5%,10%. ** significance at 5%, 10%.

The results specified that the null hypothesis of the series contains a unit root that cannot be rejected at a level for all variables in the ADF and PP unit root approaches. However, at first difference, this null hypothesis can be rejected because those variables are all stationary. Thus, the long-run relationship among these variables can be tested.

Table 2. ARDL bounds cointegration test results

Null Hypothesis: No levels relationship F-Bounds Test

Test Statistic	Value	Significance	I(0)	(1)
		10%	3.02	3.51
F-statistic	9.26	5%	3.62	4.16
K	1	2.5%	4.18	4.79
		1%	4.94	5.58

Notes: *, **, and *** denote significance at 10%, 5%, and 1% levels, respectively. For more details, Narayan (2005), showed Critical values (Table Case III: Unrestricted intercept and no trend; pg. 1988).

Table 2 shows that the F-statistic is higher than the critical upper bound value at the 10% significance level; GDP and oil prices have a long-run cointegration relationship. After the existence of co-integration is confirmed, the long run and short run are presented in Table 3 below;

Table 3. Bound test results

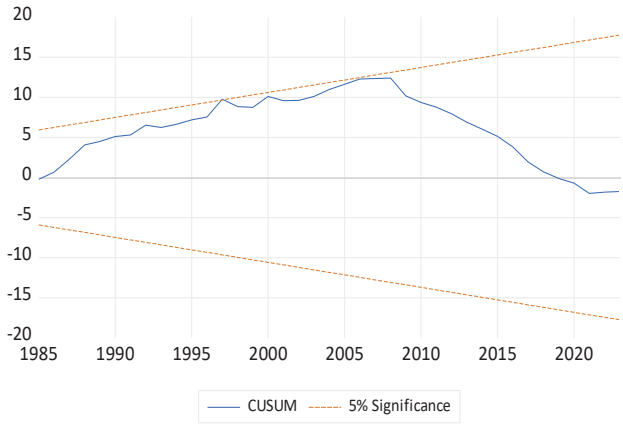
Panel A: Long- run results. Dependent Variable LM		
Regressors	**Coefficient**	**T-ratio**
LP	3.2336	0.1187
Constant	-4.3548	0.3331
Panel B: short-run results. Dependent Variable LM		
Regressors	**Coefficient**	**T-ratio**
DLOG(P)	0.5281	0.000
CointEq(-1)*	-0.0176	0.000

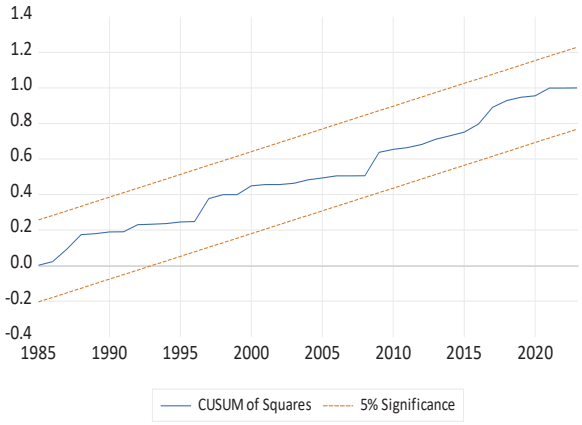
Table 3 shows that the income elasticity of imports is positive and significant in the long and short run, an increase of 1% in oil price will lead to an increase in economic growth by 3.23% in the long run, as well as in short-run results reveal that an increase 1% in oil price will generate 0.5% in economic growth in Qatar. This result confirms that economic growth in Qatar embedded to increase in oil prices. The coefficient of Error Correction Term (ECM) which yields the speed of adjustment is negative and significant, it notifies us that 1.76% of all errors or disequilibrium in the short term is adjusted in the next period.

Causality test

Null Hypothesis	Obs	F-Statistic	Prob.
LOG(P) does not Granger Cause LOG(GDP)	42	3.25431	0.0499
LOG(GDP) does not Granger Cause LOG(P)		3.77998	0.0321

Stability test:





Conclusion

The results of the econometric analysis to test the relationship between oil prices and economic growth showed that high oil prices have a positive impact on Qatari economic growth. In recent years, the State of Qatar has worked to invest gas revenues efficiently, which has enabled it to undertake many projects linked to industrial nature, making it a destination for local and foreign investment, so the study recommended that to maximize benefits from these returns, it must develop the oil industries, especially gas-related industries.

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