



Exploring Indicators Impacting Gross Domestic Product: A Case of the Gulf Cooperation Council Members

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Abstract

This study investigates the factors that influenced the economic growth of the six Gulf Cooperation Council (GCC) members from 1990 to 2021. The study employed statistical methods such as ordinary least squares (OLS), fixed-effects model (FEM), and generalized method of moments (GMM) regressions to arrive at its findings. The World Bank and International Monetary Fund (IMF) databases provided the data for this paper. The six Gulf Cooperation Council members are the United Arab Emirates (UAE), the Kingdom of Saudi Arabia, the State of Qatar, the Sultanate of Oman, the State of Kuwait, and the Kingdom of Bahrain. In fact, the economies of Gulf Cooperation Council members (countries) are highly dependent on the oil sector. Therefore, one of the main positive indicators of gross domestic product in the Gulf Cooperation Council countries is oil prices. In addition, inflation plays a significant and positive role in supporting the gross domestic product in the Gulf Cooperation Council area. In contrast, unemployment rates and the COVID-19 pandemic impacted the gross domestic product in the Gulf Cooperation Council region significantly and negatively. The implications of this study help policymakers make the right decisions and implement policies to increase economic growth in Gulf Cooperation Council countries. Furthermore, this study supports economists and academics in conducting their research in the same field.

Keyword: COVID- 19 pandemic; economic growth; gross domestic production; Gulf Cooperation Council; oil prices

1. Introduction

Studying the factors of gross domestic product is critical, as gross domestic product (GDP) represents the wealth of countries and is a very important measure for economic welfare. Additionally, financial and economic challenges are rapidly increasing around the world. Therefore, investigating negative and positive indicators of economic development would help policymakers enrich economies and avoid factors that weaken them. In the past literature review, many studies explored the significant drivers of gross domestic product, such as the studies of Jerónimo et al. (2023) on Europe and Mahran (2023) on 116 countries. This paper investigates the drivers of gross domestic product for the Gulf Cooperation Council members (the United Arab Emirates [UAE], Kingdom of Saudi Arabia, State of Qatar, Sultanate of Oman, State of Kuwait, and Kingdom of Bahrain) over the period 1990–2021. The World Bank (World Bank, 2023) and International Monetary Fund (IMF, 2023) databases provided the data for this research. The study employs statistical techniques such as ordinary least squares (OLS), generalized methods of moments (GMM), and fixed-effects models to derive its main findings. The Gulf Cooperation Council countries' gross domestic product is heavily dependent on the oil sector, and due to the volatility of oil prices, this is considered very risky. Higher oil prices would boost economic development, but a drop in prices would require Gulf Cooperation Council countries to pursue contractionary policies such as raising taxes and cutting government expenditures. As a result, Gulf Cooperation Council countries have committed to diversifying their economies. This diversification of economies has started with Saudi Arabia, which launched Saudi Arabia Vision 2030. On April 26, 2016, Prince Mohammed bin Salman, the Crown Prince of the Kingdom of Saudi Arabia, launched Saudi Arabia Vision 2030. After that, Gulf Cooperation Council countries revealed their Vision 2030, and they have similar goals to Saudi Arabia's Vision 2030. The most important goal of Vision 2030 is to reduce reliance on oil, particularly considering recent risky oil price fluctuations. There are several contributions to this research that will help fill the gap in the literature review. 1) In the literature review, the studies that examine the effects of the COVID-19 pandemic on gross domestic product growth in the Gulf Cooperation Council area are very limited. 2) There is a lack of research that finds the influence of political crises (e.g., the Arab Spring) on gross domestic product growth in the Gulf Cooperation Council region. 3) Additionally, this paper contributes to the literature review by utilizing a comprehensive, up-to-date period from 1990 to 2021. Based on these gaps, this study fills the gaps in the literature review by finding the main factors affecting the gross domestic product in the Gulf Cooperation Council region during the period 1990–2021. Consequently, this study addresses the following research topics:

What are the positive factors for gross domestic product in the Gulf Cooperation Council during the period of 1990–2021?

What are the negative factors affecting gross domestic product in the Gulf Cooperation Council region during the period 1990–2021?

However, the second section of this research identifies relevant prior studies in the field (literature review). The third section discusses the methodologies and data descriptions. The fourth section includes the study's main findings and a discussion of these findings, and the fifth section summarizes the paper.

2. Related previous studies and hypotheses development

2.1. Related previous studies

By looking at the related previous studies, there are many studies in the literature review that have investigated the determinants of economic growth, such as the studies of Ying et al. (2022) on Organization for Economic Co-operation and Development (OECD) countries and Rahman and Alam (2021) on the group of 20 (G20) countries. On the other side, there is a limitation to the studies in the literature review that explore the drivers of economic development in Gulf Cooperation Council countries (Alharthi, 2019).

Gazdar et al. (2019) examined the main drivers of economic growth using gross domestic product per capita as a dependent variable for Gulf Cooperation Council members through the period of 1996–2016. Statistically, this study used a fixed-effects model to analyze the data. The findings of this study show that gross domestic product and non-oil gross domestic product play a significant and positive role in the development of gross domestic product per capita. Moreover, the correlation between the gross domestic product per capita and inflation is significant and negative. In addition, trade openness and government expenditure decreased the gross domestic product per capita significantly.

Alharthi (2019) did another study on the factors that affected the gross domestic product per capita in Gulf Cooperation Council countries from 1990 to 2016. This study used the generalized method of moments (GMM), fixed-effects model (FEM), and random-effects model (REM) regressions. This research concludes that GDP growth and ruling laws effectively increase individual income. On the contrary, corruption, political instability, and the rule of quality negatively impacted GDP per capita. Furthermore, a higher population leads to a lower standard of living (GDP per capita). In conclusion, in the region of the Gulf Cooperation Council, there were not enough resources for a higher population for the period of the study (1990–2016). In addition, the Arab Spring and the global financial crisis (GFC) affected individual income significantly and negatively.

Boukhatem and Ben Moussa (2018) investigated the economic determinants of Middle Eastern and Northern African (MENA) countries from 2000 to 2014. The study's results indicate a strong but inverse relationship between economic progress and trade openness. Therefore, investors are encouraged to reduce their investments in the MENA region. Additionally, government consumption had a significant and negative impact on economic growth. The financial sector and services assert that domestic credits and Islamic loans positively supported economic development.

For the period 1990–2017, Ofori and Grechyna (2021) tested the GDP and its indicators, focusing on sub-Saharan countries. The statistical model utilized in this study is the pooled ordinary least squares (POLS) model. The findings confirmed that GDP per capita, inflation, and oil and natural gas rents had a significant and negative impact on GDP. In contrast, capital and remittances influenced economic development significantly and positively.

Islam et al. (2021) investigated the factors affecting GDP in Saudi Arabia during the period 1990–2019. In this study, autoregressive distributed lag (ARDL) regression was utilized for the analysis. According to the ARDL, unemployment, population, and temperature levels have a positive impact on Saudi Arabia's economy. However, rainfall and carbon dioxide

(CO₂) emissions have a significant negative impact on economic development. These results encourage policymakers in Saudi Arabia to find more strict regulations to reduce levels of pollution (CO₂) and enhance GDP growth, such as encouraging the use of green (alternative) energy sources.

2.2. Hypotheses development

Based on the discussion in the literature review above, the hypotheses can be formulated as follows:

2.2.1. Gross domestic product and foreign direct investment

According to the literature review, many studies proposed that inward foreign direct investments (FDIs) strengthen the economy significantly (Dankyi et al., 2022; Rahman & Alam, 2021; Yusuf et al., 2020). This encourages countries to attract more foreign capital and investment to enrich their economies. On the other side, very limited studies show that inward FDI levels reduce economic development (Mahran, 2023). This study tests the correlation between GDP and FDI as follows:

H₁: FDI affects GDP significantly and positively in Gulf Cooperation Council countries over the period 1990-2021

2.2.2. Gross domestic product and inflation

An extensive number of studies have examined the effects of consumer price index (CPI) on economic activities. Most studies agree that higher percentages of inflation slow economic development (Abate, 2022; Garedow, 2022). In this type of case, policymakers can find strategies to reduce inflation, like increasing interest rates. Many studies have proposed the opposite (positive) relationship between GDP and inflation (Best & Burke, 2018). Therefore, the following methods can test the association between GDP and inflation rates:

H₂: inflation rates affect GDP significantly and negatively in Gulf Cooperation Council countries over the period 1990-2021

2.2.3. Gross domestic product and unemployment

The majority of studies in the literature review found evidence that unemployment rates were significantly and negatively correlated with GDP (Okoro et al., 2020; Kim et al., 2018). As a result, increasing employment can be a solution to support economies, but sometimes uncontrolled conditions can occur to raise unemployment levels, such as the spread of COVID-19. On the contrary, a few studies propose that higher unemployment rates support economic growth (Islam et al., 2021). Therefore, we can examine the relationship between GDP and unemployment rates as follows:

H₃: unemployment rates affect GDP significantly and negatively in Gulf Cooperation Council countries over the period 1990-2021

2.2.4. Gross domestic product and population

Some studies claim that higher populations lead to better economies (Ying et al., 2022; Islam et al., 2021; Dey & Tareque, 2020). This means that economic sources and natural resources were enough for the population, and those sources have been exploited effectively. On the other hand, several studies confirm that GDP impacts the population significantly and negatively (Mahran, 2023; Ogundari & Awokuse, 2018). Based on this, this study can formulate the fourth hypothesis as follows:

H₄: population growth affects GDP significantly and negatively in Gulf Cooperation Council countries over the period 1990-2021

2.2.5. Gross domestic product and oil prices

Higher prices of oil could support the economies of oil-exporting countries but could affect the economies of oil-importing countries. In the literature review, some studies agree that oil prices influence economic growth significantly and positively (e.g., Ftiti et al., 2016). On the other side, some studies conclude that higher oil prices decrease GDP significantly (for example, Bouzid, 2012). Therefore, we can formulate the fifth hypothesis in the following way:

H₅: oil prices affect GDP in Gulf Cooperation Council countries over the period 1990-2021

2.2.6. Gross domestic product and global financial crisis

There has been lower number research examining the impacts of the global financial crisis (that occurred over the period 2007–2009) on GDP. For example, Bere et al. (2014) determined that the economy of Romania was significantly and negatively impacted by the global financial crisis. Consequently, we can formulate the sixth hypothesis as follows:

H₆: GFC affects GDP significantly and negatively in Gulf Cooperation Council countries

2.2.7. Gross domestic product and Arab Spring

Alharthi (2019) examined the effects of the Arab Spring on GDP per capita for the six Gulf Cooperation Council members. The results of this study conclude that the Arab Spring influenced individual income in Gulf Cooperation Council countries significantly and negatively. Consequently, this study explores the correlation between GDP and the Arab Spring by testing the following hypothesis:

H₇: Arab Spring affects GDP significantly and negatively in Gulf Cooperation Council countries

2.2.8. Gross domestic product and the COVID- 19 pandemic

All studies in the literature review claimed that the spread of COVID-19 impacted economies negatively, as most economic activities have been stopped or delayed over the period of the 19 pandemic such as imports and exports. Beckman et al. (2021) on OECD countries; Gagnon et al. (2023) on global economies; Habibi et al. (2022) on China; Jena et al.

(2021) on major eight economies; and Ahmad et al. (2020) on China. Thus, this study examines the effects of COVID-19 on Gulf Cooperation Council economies through the following hypothesis:

H₈: COVID-19 pandemic affects GDP in Gulf Cooperation Council countries significantly and negatively

3. Methods of the study

3.1. Descriptive data

The main sources of the data in this study are the databases of the World Bank (World Bank, 2023) and the International Monetary Fund (IMF, 2023). A sample of six Gulf Cooperation Council countries, namely the United Arab Emirates (UAE), Kingdom of Saudi Arabia, State of Qatar, Sultanate of Oman, State of Kuwait, and Kingdom of Bahrain, was taken in this study. The period of this study is from 1990 to 2021, and this period has significant challenges for Gulf Cooperation Council economies, such as the global financial crisis, the Arab Spring, and the COVID-19 outbreak. In this study, the dependent variable is GDP, and the independent variables are FDI, inflation, unemployment, population, oil prices, the global financial crisis, the Arab Spring, and the COVID-19 pandemic. Table 1 below provides the data descriptions for the variables.

Table 1: Data descriptions for the variables for Gulf Cooperation Council countries over the period 1990-2021

Factor	Description	Statistics					Anticipated Sign
		Obs	Mean	S.D.	Minimum	Maximum	
Dependent variable							
GDP	Natural logarithm of GDP	192	4.7646	6.493	-8.855	33.990	-----
Independent variables							
FDI	% Growth of FDI	192	2.327	3.770	-5.288	33.566	+
Inflation	% Inflation rates	192	3.028	4.143	-4.863	15.050	-
Unemployment	% Unemployment rates	192	2.438	1.880	0.110	7.450	-
Population	Log (Population)	192	14.942	1.1822	13.073	17.398	-
Oil prices	Brent oil prices	192	49.658	31.255	12.716	111.965	+
Global financial crisis	Dummy = 1 for the period 2007-2009, otherwise zero	192	0.093	0.292	0	1	-
Arab Spring	Dummy = 1 for the period 2011-2013, otherwise zero	192	0.093	0.292	0	1	-
COVID- 19	Dummy = 1 for the period 2019-2021, otherwise zero	192	0.093	0.292	0	1	-

Sources: World Bank (2023) and IMF (2023)

3.2. Statistical models

This study utilizes ordinary least squares (OLS), fixed-effects model (FEM) and generalized method of moments (GMM) regressions to analyze the data. The model of the study can be formulated as follows:

$$GDP_{it} = \alpha + \beta_1 FDI_{it} + \beta_2 INFLATION_{it} + \beta_3 UNEMPLOYMENT_{it} + \beta_4 POPULATION_{it} + \beta_5 OIL_{it} + \beta_6 GFC_t + \beta_7 ASPRING_t + \beta_8 COVID19_t + \varepsilon$$

Where:

GDP_{it} is the natural logarithm of gross domestic product, α represent the constant, β is the coefficient, $INFLATION_{it}$ is the percentages of inflation rates, $UNEMPLOYMENT_{it}$ is the percentages of unemployment rates, $POPULATION_{it}$ is the natural logarithm of population, OIL_{it} represents oil prices, GFC_t is the global financial crisis, $ASPRING_t$ is the Arab Spring, $COVID19_t$ is the COVID- 19 pandemic, ε is the error term.

Before running the analysis, a test of the existence of multicollinearity can be done through the correlation matrix as shown in Table 2. Based on the values in Table 2, there is no multicollinearity in the data, as all values are below 70%.

Table 2: Correlation matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) GDP	1								
(2) FDI	0.0626	1							
(3) Inflation	0.2606	-0.0007	1						
(4) Unemployment	-0.1997	-0.1029	-0.0611	1					
(5) Population	-0.196	-0.1891	-0.0248	0.6343	1				
(6) Oil prices	-0.0371	0.1092	0.0676	0.062	0.2733	1			
(7) GFC	0.0172	0.1817	0.2876	0.022	0.0405	0.2862	1		
(8) Arab Spring	0.0491	0.004	-0.0368	0.0159	0.1055	0.6286	-0.1034	1	
(9) COVID- 19	-0.2836	-0.0286	-0.2143	0.0657	0.1584	0.0956	-0.1034	-0.1034	1

4. Findings of the study and Discussion

4.1. Findings of the study

Table 3 reports the main significant indicators of the GDP of the Gulf Cooperation Council members over the period 1990–2021. Table 3 illustrates the findings of the ordinary least square, fixed-effects model, and generalized method of moments regressions. The summary of the results suggests that inflation increased GDP significantly, but unemployment and the COVID-19 pandemic decreased GDP significantly. However, the next section, as a discussion, explains in detail the linkage between results and the literature review.

Table 3: Findings of the study for the determinants of GDP for Gulf Cooperation Council countries through the period 1990-2021

Regressions	Ordinary least squares	Fixed-effects model	Generalized method of moments
Dependent Variable	Gross domestic product	Gross domestic product	Gross domestic product
Independent Variables			
(H ₁) Foreign direct investment	0.0950 (0.1240)	0.1668 (0.1322)	0.0950 (0.0820)
(H ₂) Inflation	0.3541*** (0.1138)	0.4737*** (0.1576)	0.3541*** (0.1465)
(H ₃) Unemployment	-0.5579 (0.4605)	-1.3768* (0.7935)	-0.5579 (0.5160)
(H ₄) Population	-0.0060 (0.7830)	-1.0507 (1.8426)	-0.0060 (0.7077)
(H ₅) Oil prices	-0.0108 (.0231)	0.0042 (0.0331)	-0.0108 (0.0235)
(H ₆) Global financial crisis	-1.2208 (1.8176)	-1.9768 (1.8039)	-1.2208 (1.7670)
(H ₇) Arab Spring	1.4370 (2.2109)	1.0450 (2.3406)	1.4370 (1.5745)
(H ₈) COVID- 19	-4.8178*** (1.6413)	-3.6861** (1.7536)	-4.8178*** (1.1130)
Constant	5.8934 (10.4314)	22.2195 (26.8020)	5.8934 (8.4971)
N	192	192	192
R ²	0.61	0.71	0.61

Notes: standard error in parentheses, *** p < 0.01, ** p < 0.05, * p < 0.10

4.2. Discussion

(H₂) Inflation. Against expectations, the ordinary least squares, fixed-effects model, and generalized method of moments regressions suggest that higher inflation rates increase GDP significantly in Gulf Cooperation Council countries at the level of 1%, which means there is a strong correlation between GDP and inflation rates. This finding is in line with the results of Best and Burke's (2018) study but contradicts the results of Abate (2022) and Garedow (2022). The results of ordinary least squares, fixed-effects model, and generalized method of moments regressions encourage policymakers in Gulf Cooperation Council countries to keep inflation rates below 2%, which is the ideal percentage of inflation rates.

(H₃) Unemployment. As expected, the fixed-effects model outcome indicates that higher unemployment rates slow GDP development significantly. This allows policymakers, public and private organizations to create more jobs that enrich employment and enhance GDP. This result aligns with the findings of Okoro et al. (2020) and Kim et al. (2018). In contrast, Islam et al. (2021)

found the opposite result, as higher percentages of unemployment led to better GDP levels in Saudi Arabia during the period 1990–2019. The results of ordinary least squares and generalized method of moments regressions suggest that there is an insignificant and negative association between GDP and unemployment rates in Gulf Cooperation Council countries for the period 1990–2021.

(H₈) COVID- 19. As anticipated, the COVID-19 pandemic has significant and negative effects on the GDP of Gulf Cooperation Council countries. This conclusion complies with the findings of the previous studies in the literature review (Gagnon et al., 2023; Habibi et al., 2022; Beckman et al., 2021; Jena et al., 2021; Ahmad et al., 2020). This result pushes policymakers to find more hedging and strategies to face any future economic, financial, and social challenges and risks.

In conclusion, inward FDI and the Arab Spring affected the GDP of Gulf Cooperation Council countries positively but insignificantly. On the other hand, population growth and the global financial crisis had a significant and negative impact on Gulf Cooperation Council countries' GDP. Finally, according to oil prices, ordinary least squares and generalized method of moments regressions show that there is an insignificant and negative correlation between GDP and oil prices, but fixed-effects model suggests that there is an insignificant and positive relationship between GDP and oil prices.

5. Conclusion of the study

This study was aiming to investigate the significant positive and negative indicators of GDP for the six Gulf Cooperation Council members through the period 1990–2021. The data was collected from the databases of the World Bank and the International Monetary Fund (IMF). The statistical regressions utilized in this study were ordinary least squares, fixed-effects model, and generalized method of moments models. The findings suggest that inflation was a significant and positive measure of GDP. On the opposite side, unemployment and the COVID-19 outbreak played a significant negative role in reducing GDP.

The findings of this paper assist policymakers in Gulf Cooperation Council countries in maintaining a moderate inflation rate of no more than 2%. Moreover, finding solutions to lower the levels of unemployment rates through creating more jobs that can empower the labor force and support the economies of Gulf Cooperation Council countries. According to the COVID-19 pandemic, as in the literature review, the economies of all countries were affected significantly and negatively. This encourages policymakers to develop more hedging strategies to face any challenges in the future and avoid a negative impact on GDP.

Abate (2022) and Dankyi et al. (2022) examined the determinants of the GDP but did not extend to examining the effects of crises such as COVID-19 and the global financial crisis on the GDP.

According to the limitations of the study, the data was limited for some Gulf Cooperation Council members, like the data in the year 2022 was not available; therefore, the data ranged from 1990 to 2021.

In further research, an up-to-date period can be examined (2022), more statistical regressions can be utilized, more indicators of GDP can be tested, and more countries and regions can be included, such as the region of Middle Eastern and North African (MENA).

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