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The Impact of pandemic and Economic Regularity on the GCC Financial Market

By

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Abstract

This research investigates the Impact of COVID-19 on the GCC index, exchange, and oil return. It compares it with the outcomes of structural changes in the GCC economy: corporate tax and the Goods and Services Tax (VAT) implementation. Event study (constant return Model) and standard Vector Auto-regression show the Impact of COVID-19 on these three variables compared to that of corporate tax and the VAT. Using daily index return, oil price, and exchange. Saudi Arabia's data is from Oct 21, 1998, to Feb 10, 2022. United Arab Emirates data is from Aug 29, 2005, to Feb 10, 2022. Kuwait data from Dec 1, 2022. Qatar data is from Dec 31, 2001, to Feb 10, 2022. Oman data is from Dec 22, 2000, to Feb 10, 2022. Bahrain data is from Jun 1, 2014, to Feb 10, 2022. Corporate tax has a short-term impact on the index return of UAE and Oman, and it has a short-term effect on the oil return of UAE and Qatar. While in the long term, the impact affects the oil return of SA and UAE. VAT has a short-term impact on the index return of SA and Oman, and it has a short-term effect on the oil return of Bahrain. Although, in the long term, the impact is just affected the oil return of Bahrain.COVID-19 has a short-term impact on the index return of SA, and it has a short-term effect on the exchange return of SA, UAE, Kuwait, Qatar, and Oman. Although, COVID-19 has no long-term impact on GCC Variables. In addition, VAT and corporate tax have more Impact than COVID-19 on the long-term GCC oil return. Moreover, VAT, corporate tax, and COVID-19 have no impact on the long-term index return and exchange return. This study provides new insight into the financial market during external events which may have a direct or indirect effect. In addition, it gives a brief picture of the impact of new economic policies and pandemics on the GCC, the GCC index, exchange, and oil return by using Event Study (constant return Model) for short-term estimation and standard Vector Auto-regression for long term estimation.

Keywords- Event Study, Constant Return Model, Vector Auto-regression, Corporate Tax, COVID-19, VAT.

Paper Type- Master Thesis

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Nomenclature

GCC	Gulf Cooperation Councils
SA	Saudi Arabia
UAE	United Arab Emirates
VAR	Vector Auto-regression
CT	Corporate tax
VAT	Value Add Tax
IR	Index Return
ER	Exchange Return
OR	Oil Return
CAR	Cumulative Abnormal Return
AR	Abnormal Return
SD	Standard deviation

Chapter One- Introduction

1.1 Background

1.1.1 COVID-19

COVID-19 is a disease that spreads worldwide (December 31, 2019) (world health organization, April 27, 2020). This pandemic has impacted the world's economies, and this study focuses on the impact of COVID-19 on GCC countries.

While all significant stock markets reached their lowest point during March 2020 for the COVID-19 financial crash, the subsequent recovery has been uneven. Some markets have rebounded to reach record highs by 2020 (notably in the U.S.), while others (such as the U.K.) have not yet reached pre-coronavirus levels (Zhang, Hu& Ji, 2020). Pandemic-related developments have also affected other types of financial markets. When the pandemic started, government bond yields dropped as investors sought refuge in safe havens. While U.S. bond yields have increased more rapidly over 2020 than German bond yields, this is indicative that investors have more confidence in the U.S. economy than the German economy. The commodity markets also experienced varying returns in 2020, with precious metals outperforming equities, although overall commodity prices lost money (Hasan, Hassan, Rashid & Alhenawi, 2021).

The following graphs represent the impact of COVID- 19 on the different stock markets in other countries from Jan 2020 until now. This statistic investigation includes twelve countries; Brazil (Bovespa Index), Chain (CSI 300), Eurozone (Euro STOXX Index), France (CAC 40), Germany (DAX 30), Global (MSCI World Index), Hong Kong SAR(Hang Seng Index), India (BSE Sensex Index), Japan (Nikkei 225), Russia(MONX Russia Index), U.K. (FTSE 199), U.S. (S&P 500, NASDAQ 100, DOW 30).

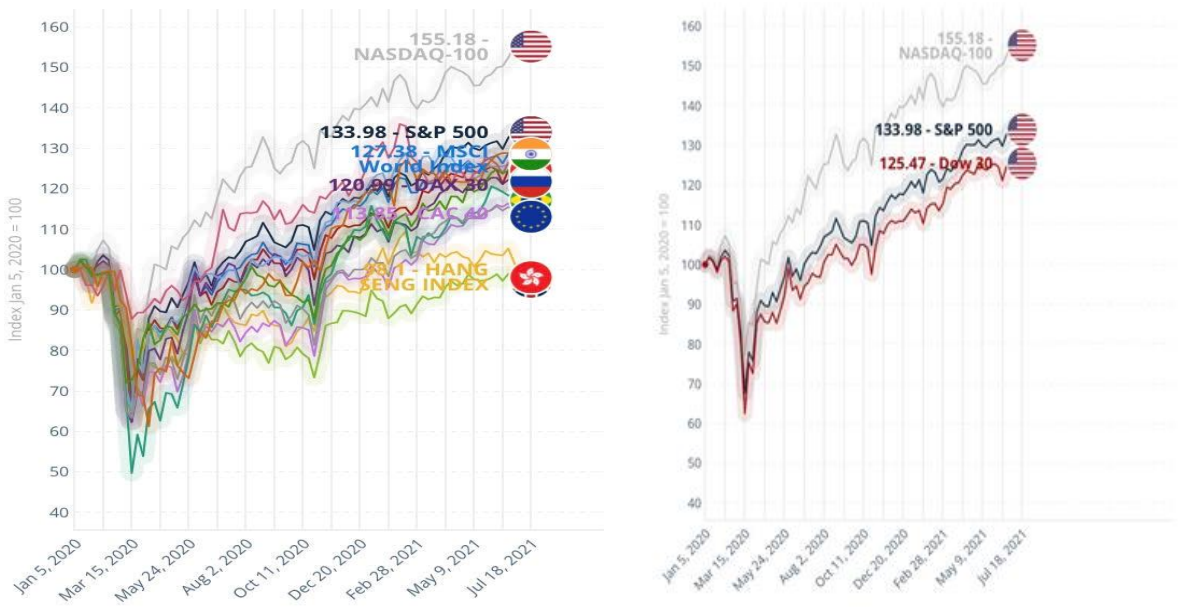

Figure1 1 The performance of various stock exchanges since 2020

It is also essential to consider which types of companies operate in different industries when it comes to the uneven recovery in the financial markets following Corona. The NASDAQ, which consists mainly of technology companies, recovered rapidly more than other stock exchanges. There are many fast-growing companies on the NASDAQ in 2020. Many of these companies (such as Amazon and PayPal) are beneficiaries of online retailing growing due to lock-downs. On the other hand, companies that lost the most value over the next decade tend to operate in more traditional industries, such as energy and tourism. Tourism and commuting were impacted during the pandemic, which is not surprising. Consequently, financial markets where a high concentration of shares belonged to companies benefiting from the COVID-19 recovered faster than more diversified, traditional markets (Statista, 2022).

Global economic activity has been seriously disrupted as a consequence of the Coronavirus pandemic (COVID-19). Financial vulnerabilities are being exposed, and the post-financial crisis economic system is being tested. In response to the Coronavirus crisis, the IMF has provided financial assistance at unprecedented speed and magnitude to its member countries, primarily to protect the most vulnerable and ensure a comprehensive, inclusive, and sustainable recovery. Kristalina Georgieva, IMF Managing Director, noted ahead of the IMF/World Bank Annual Meetings in April 2021: "Virtual vaccines have helped millions." Meanwhile, economic inequality

is increasing, and too many countries are falling behind. The IMF continues to assist developing nations through policy advice, financial support, capacity building, and debt relief for the poorest countries during this trying time (Su, Dai, Ullah, & Andlib, 2021).

1.1.2 VAT

According to GCC countries: Comparison of VAT regimes in Bahrain, Oman, Saudi Arabia, and UAE. (2020, October 23), value-added tax (VAT) is the goods and services tax paid for domestic consumption on most goods and services sold. The VAT is remitted to the government; it is produced by consumers and businesses selling goods and services. Saudi Arabia introduced the idea of VAT in February 2017 and applied VAT of 5% on January 1, 2018, and then increased up to 15% on July 1, 2020. There is an expectation of VAT on two types of products while the rate is 50% on soft drinks and 100% on energy drinks and tobacco goods. The businesses or individuals with supplies exceeding within twelve months SAR 375,000 must apply the VAT while it's optional for companies or individuals with supplies exceeding within twelve months SAR 187,500. Also, UAE President planned a new UAE VAT system on July 31, 2017, and applied on January 1, 2018. Different percentage of taxes for the following goods: 100% on tobacco and tobacco products, electronic smoking devices and energy drinks, and 50% on carbonated drinks and sweetened drinks. Additionally, Bahrain introduced the idea of VAT on December 30, 2017, and applied VAT of 5% on January 1, 2019, governance by National Bureau for Revenue (NBR). There is no tax for the following goods and services: Basic food products, General medical services, Passenger transport services, Oil and gas sector, and International air tickets. Different percentage of taxes for the following goods: 100 % on Tobacco and its derivatives, 50 % on Carbonates and soft drinks, and 100 % on Energy drinks. Moreover, Oman the implementation date 1 April 2021- was announced in October 2020 However, Qatar and Kuwait don't impose VAT (GCC countries: Comparison of VAT regimes in Bahrain, Oman, Saudi Arabia, UAE, 2020).

1.1.3 Corporate Tax

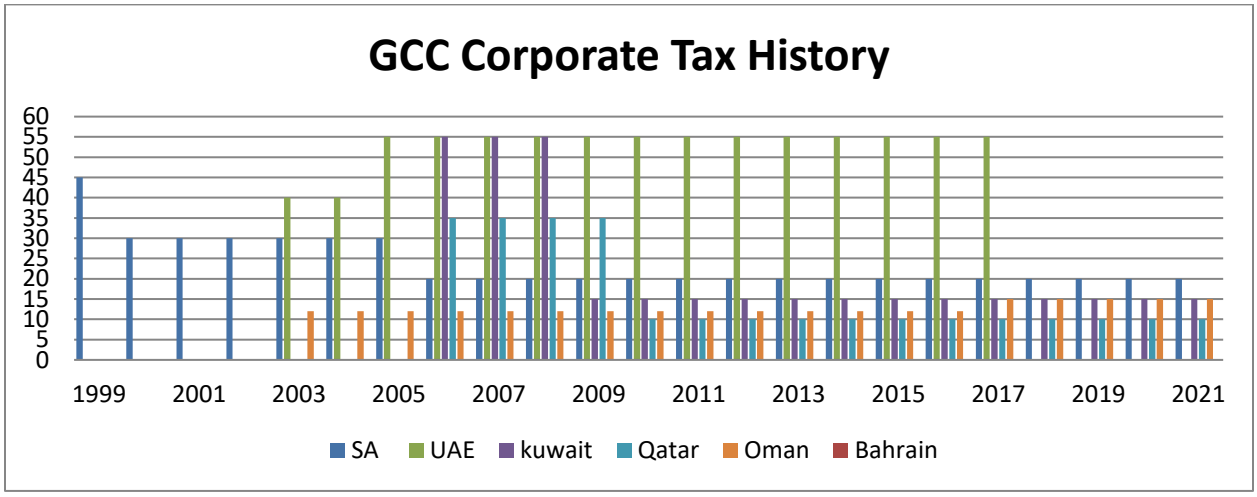

Figure1 2 GCC Corporate Tax History

Saudi Arabia Corporate Tax started in 1999 with 45%, and it was the first country in GCC to apply the corporate tax. After 2006, the corporate tax becomes fixed until now by 20%. It's classified as the Non-Saudi taxpayer's share of a resident company is paying 20% of return and 2.5% (Zakat) while Saudi Shareholder is just paying 2.5% (Zakat). However, UAE Corporate Tax started in 2003 with 40%. It then increased up to 55% from 2005 to 2017. Then, it's become that most businesses did have no corporate tax, except oil companies at 55% of the company's operating profits and foreign banks in the UAE. Although Bahrain Corporate Tax doesn't apply corporate tax system, there is an exception for the oil and gas industry, and there is corporate tax at 46%. Moreover, Qatar Corporate Tax started in 2006 with 35% from 2006 to 2009; then it fell to 10% in 2010 without any exceptions. The corporate tax of Oman started in 2003 with 12% until 2015, and then it increased to 15% until now. However, there is an exception for petroleum incomes tax; instead of 15%, it's 55%. Additionally, the corporate tax of Kuwait started from 2006 to 2008 with the rate of 55% after that; it decreased up to 15% until now (TakeProfit. 2021).

COVID-19 is a pandemic that spreads worldwide and it impacted the world's economies. 23, March 2020, is the first that GCC applied curfew and this lead to many problem, Declining consumption, Declining investment, increasing government expenditure, and Declining of net exports (ex, oil price decrease) (Nundy, Ghosh, Mesloub, Albaqawy, & Alnaim, 2021).

1.1.4 Oil

Low oil prices and the Coronavirus have affected the GCC economy in a double-whammy that has led to a shutdown of much of the non-oil economy. Due to a fall in global demand and Government lock-down measures, oil prices have plummeted, triggering a price war between suppliers. Global risk resentment is at a historic high due to the decline in equity markets since February and the widening of sovereign spreads across the Middle East. Additionally, manufacturing and production are disrupted, and investment plans are stalled. In addition to these adverse shocks, consumer and business confidence plummeted, resulting in ratings that rating agencies closely monitor (Shehabi, 2022).

Economic growth and oil are closely associated, so oil has been affected by global growth outlooks. In addition to demand destruction due to COVID -19, the OPEC+ disagreement also contributed to the recent collapse of oil prices. Currently, in a dynamic scenario where COVID-19 is in charge, news on OPEC+ agreements, stimulus, etc. cause prices to rise, while news on oil storage and extension of lockdowns causes prices to fall sharply (Global Investment Outlook, 2019). Those factors have increased the volatility of oil prices. USO is an exchange-traded fund that attempts to replicate, as closely as possible, the spot price of WTI Light, Sweet Crude oil, minus USO expenses) (Fernandez-Perez, Fuertes, & Miffre, 2023). For comparison, the Oil Price Volatility Index (OVX) measures market expectations for 30-day volatility in crude oil prices based on options on the U.S. Oil Fund LP. The Oil Volatility Index measures volatility of price changes in WTI, however, because both Brent and WTI crude prices are affected by similar sentiments and follow similar trends, the volatility index is usually viewed as representing oil volatility in general (Liu, Geng, Zhang & Wang, 2021).

Oil is one of the first commodities to suffer from the Global Financial Crisis, slowdown in global growth, trade wars, or COVID-19. It appears that oil volatility is here to stay, given the uncertainty of these events (Le et al., 2021). The GCC can move away from oil dependence by adopting measures like taxation, subsidy reductions and boosting non-oil growth However, until the GCC is more heavily focused on a non-oil economy, in addition to oil price levels, its volatile nature might affect decision making (Fasano, 2022).

Gulf Cooperation Council (GCC) members are Bahrain, Kuwait, Oman, Saudi Arabia, Qatar, and the United Arab Emirates. Oil reserves are plentiful in them all, and their economies and gross domestic products are heavily reliant on exporting oil at competitive prices to other countries. Oil price increases between 2000 and 2007 benefited the GCC nations financially. In addition, the declining oil prices have impacted their budget and economic growth since 2008 (Reiche, 2010).

1.2 Problem statement

COVID-19 is a pandemic that must be considered to protect the index, exchange, and oil market from volatility.

1.3 Scope of the study

This research covers the area of a new pandemic that affects the whole world. It specifies it in the GCC and compares it with the two most recent economic regularity factors affecting the GCC. Those are new factors that have a global impact on GCC and the whole world. This research fills the gap in the new pandemic facing the world.

1.4 Research objective

This paper aims to examine the impact of COVID-19 on the GCC index, exchange, and oil market. Compare them with the outcomes of two recent structural Changes in the GCC economy: capital tax and good and service tax VAT. The aim is to compare the results of the effects of COVID-19 with those of two other major economic policy events in GCC countries, good and service tax and corporate tax. An event study using the constant return model shows the impact of COVID-19 on index returns is severe compared to that of capital tax and the VAT in the short term. In contrast, the Standard Vector Auto-regression model shows the effect of COVID-19 on index returns is severe compared to that of capital tax and the VAT in the long term. By using daily index return, oil prices, and exchange rate. Saudi Arabia's data is from Oct 21, 1998, to Feb 10, 2022. United Arab Emirates data is from Aug 29, 2005, to Feb 10, 2022. Kuwait data from Dec 1, 2022. Qatar data is from Dec 31, 2001, to Feb 10, 2022. Oman data is from Dec 22, 2000, to Feb 10, 2022. Bahrain data is from Jun 1, 2014, to Feb 10, 2022.

1.5 Research Questions:

- What are the impact of COVID-19 on the GCC index, exchange, and oil market?
- What are the effect of VAT on the GCC index, exchange, and oil market?
- What is the effect of corporate tax on the GCC index, exchange, and oil market?
- Which factor has more impact on GCC countries' index, exchange, and oil market?

1.6 Thesis Hypothesis

This thesis aims to test the following hypothesis:

- *H0: there is no impact of COVID-19 on the GCC Index return in the short term.*
- *H1: there is a negative impact of COVID-19 on the GCC index return in the short term.*
- *H0: there is no impact of COVID-19 on the GCC Index return in the long term.*
- *H2: there is a negative impact of COVID-19 on the GCC index return in the long term.*
- *H0: there is no impact of COVID-19 on the GCC exchange return in the short term.*
- *H3: there is a negative impact of COVID-19 on the GCC exchange return in the short term.*
- *H0: there is no impact of COVID-19 on the GCC exchange return in the long term.*
- *H4: there is a negative impact of COVID-19 on the GCC exchange return in the long term.*
- *H0: there is no impact of COVID-19 on the GCC oil return in the short term.*
- *H5: there is a negative impact of COVID-19 on the GCC oil return in the short term.*
- *H0: there is no impact of COVID-19 on the GCC oil return in the long term.*
- *H6: there is a negative impact of COVID-19 on the GCC oil return in the long term.*
- *H0: there is no impact of VAT on the GCC Index return in the short term.*
- *H7: there is a negative impact of VAT on the GCC index return in the short term.*
- *H0: there is no impact of VAT on the GCC Index return in the long term.*
- *H8: VAT harms the GCC index return in the long term.*
- *H0: there is no impact of VAT on the GCC exchange return in the short term.*

- *H9: there is a negative impact of VAT on the GCC exchange return in the short term.*
- *H0: there is no impact of VAT on the GCC exchange return in the long term.*
- *H10: VAT harms the GCC exchange return in the long term.*
- *H0: there is no impact of VAT on the GCC oil return in the short term.*
- *H11: there is a negative impact of VAT on the GCC oil return in the short term.*
- *H0: there is no impact of VAT on the GCC oil return in the long term.*
- *H12: there is a negative impact of VAT on the GCC oil return in the long term.*
- *H0: there is no impact of corporate tax on the GCC Index return in the short term.*
- *H13: there is a negative impact of corporate tax on the GCC index return in the short term.*
- *H0: there is no impact of corporate tax on the GCC Index return in the long term.*
- *H14: there is a negative impact of corporate tax on the GCC index return in the long term.*
- *H0: there is no impact of corporate tax on the GCC exchange return in the short term.*
- *H15: there is a negative impact of corporate tax on the GCC exchange return in the short term.*
- *H0: there is no impact of corporate tax on the GCC exchange return in the long term.*
- *H16: there is a negative impact of corporate tax on the GCC exchange return in the long term.*
- *H0: there is no impact of corporate tax on the GCC oil return in the short term.*
- *H17: there is a negative impact of corporate tax on the GCC oil return in the short term.*
- *H0: there is no impact of corporate tax on the GCC oil return in the long term.*
- *H18: there is a negative impact of corporate tax on the GCC oil return in the long term.*
- *H0: VAT or corporate tax has more impact on the GCC Index return in the short term.*

- *H19: COVID-19 has more impact on the GCC index return than VAT and corporate tax in the short term.*
- *H0: VAT or corporate tax impacts the GCC Index return in the long term.*
- *H20: COVID-19 has more impact on the GCC index return than VAT and corporate tax in the long term.*
- *H0: VAT or corporate tax has more impact on the GCC EUR exchange return in the short term.*
- *H21: COVID-19 has more impact on the GCC EUR exchange return than VAT and corporate tax in the short term.*
- *H0: VAT or corporate tax has more impact on the GCC EUR exchange return in the long term.*
- *H22: COVID-19 has more impact on the GCC EUR exchange return than VAT and corporate tax in the long term.*
- *H0: VAT or corporate tax has more impact on the GCC oil return in the short term.*
- *H23: COVID-19 has more impact on the GCC oil return than VAT and corporate tax in the short term.*
- *H0: VAT or corporate tax has more impact on the GCC oil return in the long term.*
- *H24: COVID-19 has more impact on the GCC oil return than VAT and corporate tax in the long term.*

1.7 Research contribution

This study provides new insight into the financial market during external events, which may have a direct or indirect effect. In addition, it gives a brief picture of the impact of new economic policies and pandemics on the GCC index, exchange, and oil return by using Event Study (constant return Model) for short-term estimation and standard Vector Auto-regression for long term estimation.

1.8 Organization of the Study

There are five chapters in this thesis.

- Chapter one: the introduction included the problem statement, the scope of the study, research objective, research questions, thesis hypothesis, research contribution, and organization of the study. The remaining chapters consist of the following:
- Chapter two: this chapter presents a literature review consisting of pandemic and economic policy, COVID-19, Policy, VAT, Corporate tax, and Oil.
- Chapter three: includes the data collection, sample selection, methodology applied, and the description of all the variables and dummy variables included in this thesis.
- Chapter four: Analyzing the study's empirical findings, discussing the results and testing the hypothesis, and interpreting the findings is covered in this chapter.
- Chapter five: Conclusion and recommendations for future research are included in this last chapter, concluding the thesis.

Chapter two-Literature review:

2.1 pandemic and economic policy

2.1.1 COVID-19

COVID-19 is a new event that needs a researcher's effort to investigate its impact on the global financial markets and global banks in general and its impact on the GCC financial markets and GCC banks in specific.

Significant events affect the financial market. Notable events that have involved the financial market identified by previous studies, such as disasters (Kowalewski and Śpiewanowski,2020), news(Li,2018), sports(Buhagiaretal.,2018), and political events (Bashand Alsaifi, 2019; Shanaev and Ghimire, 2019).

The COVID-19 pandemic has impacted the connectedness of Hong Kong's financial market. To assess COVID-19's impacts and compare them with previous financial crises over the past 15 years, we construct dynamic financial networks based on correlations and partial correlations of index returns. Concerning other troubles where both network density and clustering can be explained by co-movement with market indices, both networks have a higher density and clustering during COVID-19 (Mike et al., 2021). COVID- 19 also affects the stability of financial markets (Zhang et al., 2020). Ashraf (2020) measured the stock market returns in different countries to confirm COVID-19 cases.

Regarding Topcua and Gulalb (2020), during the period March 10th - April 30th, 2020, they studied to investigate the impact of COVID-19 on emerging stock markets. Research reveals that the adverse effects on emerging stock markets began to lessen by mid-April. Asian emerging markets have experienced the highest impact of the outbreak, whereas emerging markets in Europe have had the lowest impact. In addition, the government's response time and the size of the stimulus package matter in offsetting the effects of the COVID-19 pandemic. A pandemic can affect the global economy through several channels: labor markets, global supply chains, and consumption behaviors. Stock markets are among the most critical components among these channels (see, for example, Ahmar and del Val, 2020; Al-Awadhi et al., 2020; among others). In early March, the financial markets reacted to COVID-19, though the overall economic impacts are

still unclear (Ramelli and Wagner, 2020). The government and central bank have already adopted a broad range of economic policies by late March, regarding Elgin et al., 2020; Nicola et al., 2020; Carlsson-Szlezak et al., 2020, to stem the effects of panic caused by the pandemic, the lockdown needs to be slowed down.

Forecasting the data is necessary to determine how lockdown and COVID-19 will affect the economy. Changes in time series data occur from time to time, and sometimes they happen abruptly. Estimates of the data are required to view these changes over time. Several researchers have studied COVID-19 forecasting and predictions: (Fanelli and Piazza, 2020) Applied the SIRD model to forecast the spread of COVID-19 in China, Italy, and France, (Roosa et al., 2020) studied COVID-19 generalized logistic growth model (GLM) with the real-time forecast in China, (Benvenuto et al., 2020) using ARIMA to measure the forecast of COVID-19, and (Koczkodaj et al., 2020) they used a simple heuristic (exponential curve) to predict COVID-19 outside of China.

There were dramatic impacts on financial markets worldwide by the rapid spread of COVID-19. COVID-19 created an unprecedented level of risk in the financial market. This leaded investors to suffer significant losses in a short time. They mapped the general country-specific risks and systemic risks patterns in the global financial markets. Additionally, they analyzed the policy interventions' consequences, like the US decision to implement a zero-percent interest rate and unlimited quantitative easing (QE), and to which extent these policies may introduce uncertainties moreover into financial markets (Zhang, Hu, and Jib, 2020)

The authors analyzed the connectedness within the COVID-19 spread, oil price risky shock, the financial market, geopolitical risk, and economic policy uncertainty in the US within a specific time. The results represented that the impact of the COVID-19 on the geopolitical risk was higher than on the US economic uncertainty. The COVID-19 risk is perceived differently over the short and the long run and maybe firstly viewed as a financial crisis (Sharif, Aloui, and Yarovaya, 2020)

Many scholars responded to the urgent research need on the global economy and international financial markets and the impact of the COVID-19 pandemic on them. Eichenbaum, Rebelo, and Trabandt (2020) studied the interaction between economic decisions and pandemics by utilizing the canonical epidemiology model, highlighting the trade-off between existence the

severity of the short-run recession caused by the COVID-19 spread. In contrast, Ma et al. (2020) compared global economic and COVID-19 pandemic financial effects with previous epidemic and pandemic events, like SARS (2017), H1N1 (2009), MERS (2012), Ebola (2014), and Zika (2016). Also, Goodell (2020) discusses the impact of COVID-19, making parallels on the economic and social with past crisis events. However, in corporate finance, Corbet, Hou, Yang, Lucey, and Les (2020) analyzed the "corona" on return impacts and stocks during the COVID-19 pandemics volatility behavior. Also, by considering the relationship between gold and cryptocurrencies, Corbet, Larkin, and Lucey (2020) provided consistent evidence during the COVID-19 pandemic that Bitcoin does not offer hedging nor safe-haven properties. In addition, Yarovaya, Matkovskyy, and Jalan (2020) analyzed herding in cryptocurrency markets during the pandemics and reported that herding does not get stronger during the pandemic but remains contingent on up or down markets days. Furthermore, Yarovaya, Brzeszczynski, Goodell, Lucey, and Lau (2020) discuss the COVID-19 crisis characteristics compared to the past crisis and provide directions for future research.

The research identifies the bank and country characteristics that amplify or weaken the impact of the pandemic on bank credit (Gönül Çolaka, Özde Öztekinb, 2021). By applying the difference-in-difference method to 125 banks, they found that bank lending was lower in countries more affected by the health crisis. Using the difference-in-difference method to 125 banks, they found that bank lending was more down in countries more affected by the health crisis. Academics and policymakers need to understand how the Coronavirus (COVID-19) pandemic affects the financial markets, institutions, and the real economy. Economic growth is stimulated by a well-functioning banking system (Levine and Zervos, 1998; Beck and Levine, 2004), vie liquidity provision in general (e.g., Berger and Sedunov, 2017), and - credit allocation in particular (e.g., Jayaratne and Strahan, 1996). Central banks implemented monetary stimulus policies in response to heightened concerns about corporate solvency and liquidity during the pandemic. Several countries provided their businesses with unprecedented loan guarantees and other forms of credit support (Bennedsen et al., 2020). The purchase of corporate bonds by the government, sometimes accompanied by loan guarantees, has been a critical instrument to inject liquidity into affected businesses Alstadsaeter et al., 2020). Banks were able to accommodate the surge in liquidity demand during the coronavirus pandemic due to money from liquidity injection programs

and deposits combined with high pre-shock levels of bank capital at the beginning of the pandemic (e.g., Li et al., 2020).

This article addresses the rapidly emerging literature concerning the effects of COVID-19 on the real economy and the corporate sector. Globally, increased disease incidences and severity triggered fear, anxiety, and uncertainty, resulting in a surge in risk aversion and uncertainty (Bekaert et al., 2021). The objective of those papers is to examine how banks behave during the aggregate risk episodes of a pandemic. By doing so, we contribute to the nascent literature on the effects of the COVID-19 shock on the banking sector (Acharya and Steffen, 2020; Li et al., 2020; Chodorow-Reich et al., 2020). In the first weeks after the pandemic, research shows that US bank loan demand experienced an initial, significant positive shock (e.g., Li et al., 2020; Chodorow-Reich et al., 2020). In the first weeks of the pandemic, there was an initial, significant positive shock to US bank lending. Firms began to draw down their bank credit lines and raise cash levels due to the spike in uncertainty and risk (Acharya and Steffen, 2020). These studies rely heavily on the type of bank credit and borrower heterogeneity to draw their conclusions. The authors, for example, Li et al. (2020), Chodorow-Reich et al. (2020), used supervisory data from a subset of commercial and industrial loans to demonstrate significant heterogeneities between loan types and corporate borrowers during the first two quarters of the pandemic. However, the differences became more pronounced over time. According to Acharya and Steffen (2020) and Li et al. (2020), their findings suggest that total loans for all US banks decreased during the first quarter of the crisis. We add to their results by demonstrating that, on average, global loan growth shrank during the first three quarters. As Demirguc-Kunt et al. (2020) showed, bank stocks underperform compared to other publicly traded companies and non-financial institutions. The findings support the fact that banks are more sensitive to uncertainty. The study supports De Jonghe et al. (2019, 2020) that banks reallocate credit strategically across industries. Moreover, they showed that banks also reallocate credit over time. More specifically, bank credit growth tends to decline when uncertainty and risk suddenly and exogenously increase.

By using the daily returns of the major stock market indices in the Gulf Cooperation Council (GCC) countries from April 1st, 2020 to June 26th, 2020, in light of COVID-19 confirmed cases and deaths. According to a panel data regression analysis, stock markets in the GCC countries responded significantly negatively, mainly to new and total deaths confirmed by COVID-19 but

not to COVID-19 confirmed cases. Hence, during the COVID-19 outbreak in GCC countries, stock market returns decreased as confirmed deaths increased. Based on further analysis, GCC stock markets are positively impacted by crude oil (WTI) price and negatively by variations in implied volatility in the global oil and stock markets (Bahrini and Filfilan's, 2020).

Consequently, more research is needed on the financial impact of Coronavirus outbreaks elsewhere in the world. Second, GCC countries are currently experiencing a double shock from the COVID-19 pandemic and the collapse of oil prices. It is essential to conduct further research on the economic effects of coronavirus outbreaks. GCC economies are still dependent on oil as their primary export and source of revenue, despite their considerable efforts to diversify. GCC countries are highly reliant on oil revenues, making them particularly vulnerable to external shocks (Al-Maadid et al., 2020).

A study was conducted to determine the effect of 2020 Coronavirus-19's worldwide spread on stock markets in GCC countries. Coronavirus spread was evaluated through a combination of cumulative cases, new cases, cumulative deaths, and new deaths. Coronavirus outbreaks are measured by the number of infections per million population, whereas stock market returns are measured by the number of shares in the stock market index. The authors exploited the effects of 2020 COVID-19 worldwide spreading on stock markets. Research in this field focuses on Coronavirus spread in the highly infected countries and the developed stock markets. A low level of Coronavirus infection in emerging financial markets seems less attractive to scholars concerned with Coronavirus spreading on stock markets. Due to that, the authors tried to investigate the GCC stock markets' reaction to the COVID-19 spread. During the research period, significant differences were found among stock market indices. Moreover, Coronavirus deaths appear to impact stock market returns substantially. Furthermore, there is no evidence that these effects will continue during April and May 2020 (Alber, Nader & Saleh, Amr, 2020).

2.1.2 Policy

The examination of how monetary policy shocks affect the stock market of the United States (US) depending on investor sentiment. The authors used an estimator that uses high-frequency surprises as a proxy for structural monetary policy shocks, derived by integrating current short-term rate surprises, which are least affected by information effects, into a vector autoregressive

(VAR) model as an exogenous variable. The researchers found that when time-varying model parameters are considered, the negative impact of contractionary monetary policy shocks on index returns is more substantial in the state associated with higher investor sentiment. In addition to being robust to alternative sample periods (which do not include the zero lower bound) and model specifications, their results have important implications for academics, investors, and policymakers (Cepni & Gupta, 2021).

2.1.2.1 VAT

The efficient market hypothesis divides the market into three segments based on how efficiently it responds to private and public information. The study examined whether the market is volatile following the announcement of VAT rates and changes to the VAT rates and tests the semi-strong efficiency of Indian stock markets. The declaration of VAT rates and the change in VAT rates affected stock market volatility. Governments imposed cascading taxes before the Goods and Service Tax. Taxes will be changed, which will affect investors' sentiments, as seen by their reaction to the stock market. The closing prices of NSE 10 sectoral indices and Nifty index were used. GARCH, TGARCH, and OLS were used in the study. In this way, the study was helpful to investors, portfolio managers, and regulatory bodies (Saran, 2018)

VAT helps eliminate many exemptions and multiple taxes that exist in the current indirect tax framework (Chaurasia, Shweta, Kumar Sen, 2016). In addition to removing cascading taxes, VAT also creates a common national market for all indirect taxes in India (Sehrawat, Dhanda,2015). The VAT lowers the cost of doing business, making domestic products more attractive to international and local customers. The VAT is expected to provide manufacturers and service providers with differentiated treatment (Sehrawat, Dhanda, 2015). In the past, several studies examined the impact of public information on the stock market (Gupta, Gedam, 2014). As a result of VAT implementation, consumers will be able to pay less for goods and services in the long run because the tax burden will be reduced (Garg, 2014). Researchers examined whether the capital market reacted to political announcements strongly or semi-strongly (Sathyanarayana, Gargesha, 2017). The weak form efficiency of the stock market has been studied (Anjala, Kaur Kalra, 2015; Deep Sharma, Mahendru, 2009).

Gulf Cooperation Countries include six countries, such as Qatar, Kuwait, Bahrain, Oman, Qatar, and UAE. Since January 1st, 2018, all these countries have implemented value-added tax.

The amount of VAT on some leisure items is 5%. As a result, there was a desire to reduce the dependence on petroleum and other hydrocarbons as a source of revenue. The tax applies to specific goods and services, and it is consumption-based. In addition to regulating tax functions, the system helps businesses transform or run efficiently and lower operational costs such as cost of IT, supply chain, cashflows, marketing, and accounting. Various business processes should be monitored to help the company operate as efficiently as possible. Over the last two decades, United Arab Emirates has tended to achieve the highest level and standard of business, and it has become a prosperous economy-based country. A large number of foreign companies from Europe, Asia, and the Americas are establishing business ventures in the UAE and outsourcing. Foreign Direct Investment (FDI) is used here as an effective tool to increase economic levels while decreasing trade barriers and complexities. Dubai and Abu Dhabi are the main emirates in the UAE, an attractive place and lucrative investment opportunity for those companies wishing to establish their presence in the region (Bala, Kumar and Nadeem, 2019),

2.1.2.2 Corporate tax

Different tax policy innovations were examined for their effect on stock market returns. Arin, Mamun, and Purushothman, (2009), used a vector autoregressive model to test whether financial markets serve as a transmission mechanism for tax policy innovations based on causality between fiscal policy and financial market performance. According to their findings, indirect taxes have a more significant impact on market returns than labor taxes. Furthermore, corporate tax innovation has no statistically significant effects on index returns. The researchers hypothesized that this result resulted from the ability of firms to switch between equity financing and debt financing (Arin, Mamun, and Purushothman, 2009).

After1996, tax-law change initially allowed banks to convert to S-corporations for the first time, identifies tax and nontax factors associated with their conversion from taxable C-corporation to nontaxable S-corporation from 1997 to 1999. Banks can save dividend taxes, avoid alternative minimum taxes, and minimize state income taxes; they are more likely to convert. The likelihood of conversion is reduced when banks cannot access equity capital, carry forward corporate tax losses, and pay penalties taxes on unrealized gains arising after conversion. Banks would be less likely to convert when converting, would limit access to equity capital, nullify corporate tax loss carryforwards, and create potential penalty taxes on unrealized gains. Probably because of the

write-off of deferred taxes at conversion, banks with significant deferred tax assets are less likely to convert. In addition, they examined the decision-making process before banks become S-corporations. By altering their capital structures, selling appreciated assets, and strategically setting dividends, converting banks can maximize net conversion benefits (Hodder, McAnally, and Weaver, 2003).

2.2 Oil

Due to the region's geographical location, the GCC is well endowed with natural resources, particularly oil. Oil is a significant source of revenue for the countries in the area, so fluctuations in oil prices affect the entire economy. The cost of oil fell below $30 a barrel in 2016 after rising over $100 a barrel for a long time (Hiscox, 2016). Gulf members lost $380 billion in revenue in 2015, according to the International Monetary Fund (IMF). Researchers and analysts have been identifying factors that affect demand for oil produced in the region since the plunge in global oil prices, such as the slowdown in China, India, and Europe, as well as the increased production of shale oil in the US and elsewhere. Consequently, the supply of oil has increased overall, although a significant portion of it is imported from outside the GCC, while at the same time, the demand has declined significantly (Rodger, 2016).

The biggest banks in any country must be stable and sustainable. Big banks typically stop lending when they become unstable and vulnerable. Consequently, the economy enters a recession or slows down. The authors studied 30 large financial institutions operating in six Gulf Cooperation Council countries are examined them for their financial stability and sustainability. These banks conduct seventy percent of GCC banking. A Monte Carlo simulation was performed, assuming that the key drivers could vary randomly by twenty percent on either side of the current value. Conclusions were drawn based on 300 simulations of the bank's balance sheet and income statement over the next five years. A COVID-19 pandemic and low oil prices make 2020 challenging for GCC countries, but future years may be better. According to the study, several banks might become financially insolvent due to the simulations indicating lower-than-expected profitability, unacceptably low capital ratios, and the potential for heavy credit losses during periods of economic turbulence such as the current COVID-19 pandemic. Simulations allow the paper to shed light on the factors contributing to bank weakness and instability (Alkharusi & Murthey, 2020).

During the past decade, the Gulf Cooperation Council (GCC) insurance industry, including conventional insurance and Takaful, has seen rapid growth. Despite this, the economies of this region depend heavily on oil as a source of revenue and lack financial development. As a result, the present study examines the impact of oil prices and the financial markets on the cost efficiency of the insurance and Takaful sectors in Gulf Cooperation Council (GCC) countries from 2009 to 2016. As oil prices increase, the relationship between efficiency and price changes positively to negative, while the relationship between efficiency and the financial market is negative. Despite the differences between conventional insurance and Takaful, there is no clear evidence of the effects of oil prices on efficiency. However, the financial market differs significantly, with a negative impact on conventional insurance and a positive impact on the Takaful business. This study's regulatory and management implications came from the fact that Takaful is rapidly growing in the GCC compared to conventional insurance. Thus the financial market may have added benefits for the GCC region. Despite this, caution is needed regarding the impact of the financial markets on conventional insurance. Moreover, management may have to develop strategies to handle the nature of the GCC economies to avoid oil price stocks (Alshammari, Alhabshi & Saiti, 2019).

There is a limited body of literature regarding the relationship between oil prices and efficiency at financial firms. In the only study that looked at this connection, Said (2015) investigated the effect of oil prices on efficiency scores in Islamic banks during the financial crisis of 2008-2009 and found no direct relationship between the two. However, draw some considerations from this relationship, such as the resource curse or paradox of plenty. The resource curse results from resource-rich countries failing to use their natural resources effectively (Humphreys et al., 2007). It is believed that governments in these countries overspend on salaries, fuel subsidies, and other social services while underspending on health, education, and other social services (Ross, 2015). The government must spend its revenue efficiently to avoid economic burdens. From 1970 to 2011, Hartwell (2016) studied 130 countries with abundant and scarce resources. According to his research, the countries with significant natural resources use their resources less efficiently. Hardwell (2016) examines 130 countries with abundant and scarce resources from 1970 to 2011. According to him, the countries with significant resources are less efficient with their help. Polterovich et al. (2010) also find that human capital accumulation is slower, and institutions are worse in resource-rich countries.

GCC countries export and supply the vast majority of the world's oil and have been oil-dependent economies for decades, so any change or shock in oil prices are very likely to affect them. Stock markets are affected by oil price turbulences in the long run. Since there is a correlation between oil prices and stock markets in many oil-producing countries, this study examined this correlation in GCC countries as significant oil producers and exporters. They studied the short- and long-term impact of oil price changes in the GCC countries, the consequences of stock market price changes in response to oil price changes in the GCC countries, and the effect of stock price changes on the local economies of GCC countries. Analyzing monthly stock market and oil price data from November 2006 to February 2015, the Auto Regressive Distributive Lag Model (ARDL) was utilized to achieve the study objectives. The study focused on all GCC countries: Kuwait, Bahrain, Qatar, Oman, KSA, and the UAE. In contrast to all previous studies, this found no evidence of a co-integration between oil prices and stock markets in all GCC countries except for Oman, where co-integration was found. However, the results showed a short-run relationship between oil prices and stock market prices (Alqattan & Ahlia, 2016).

Chapter Three-Data and Methodology

3.1 Methodology

3.1.1 Event Study:

The event study method is generally used in empirical literature to analyze the impact of events on stock markets. Market efficiency is a fundamental assumption of event study methodology. A market with an efficient mechanism will reflect the effects of the event immediately in the price of the financial market. Over a relatively short period, we will be able to observe the event's economic impact. In the event analysis, however, a t-test or other nonparametric test is used to test the null hypothesis (such as no abnormal returns on the stock market) at the time of the event. Due to the kurtosis and volatility-clustering characterization of financial time series, especially securities traded continuously in the market, this could lead to misleading results (Event Study – LAMFO, 2017).

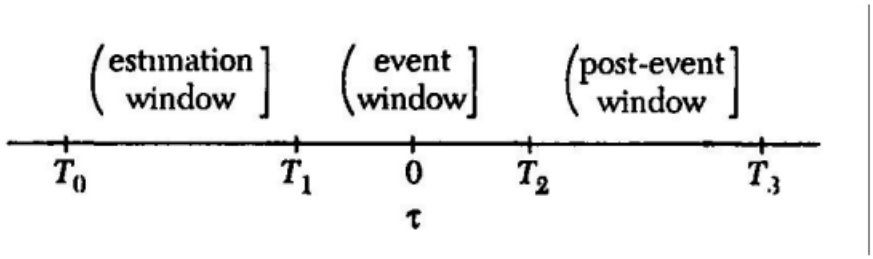

Figure1 3 Timeline of event study

The event window is the period during which the security prices involved in the event will be examined. While a post-event period that is too short might fail to show the full effects of an event, a post-event period that is too long might not yield accurate results because it could include the impact of other events that occurred during the same period. We will calculate the expected returns using the constant return model during the event period.

Equation 1 Constant Return Model

$$Rait = Rit - E(Ri) \qquad 1$$

With the constant return model, we can calculate expected returns every day during the event. To get the abnormal return every day in the event window, we will subtract the expected return from the actual return. Each variable for each country has a specific date for each event that should be specified in the model. There is three highlighted time: anticipation (30 days before the event), adjustment (30 days after the event), and estimation window (50 days before anticipation). In addition, calculate the return of each variable by using the constant return model. Then, calculate the average estimation window. Also, calculate the standard deviation of the whole event (estimation window, anticipation, adjustment, and event day), 30 days (anticipation) of the event, and 61days (anticipation, adjustment, event day) of the event. The results obtained from this study are return, T. stat, and P. value for both abnormal return AR and cumulative abnormal return CAR. Estimation of abnormal return:

Equation 2: Cumulative Abnormal Return CAR

$$CARi(T1,T2) = \sum_{t}^{T2} T1 = ARit \qquad 2$$

The following table represents the event's date for each country—this date states between anticipation and adjustment.

Table 1: GCC event day's

	Event	Event Time
SA	CT	31/12/1999
	VAT	01/01/2018
	COVID-19	30/01/2020
UAE	CT	31/12/2008
	VAT	01/01/2018
	COVID-19	30/01/2020
Kuwait	CT	31/12/2006
	VAT	
	COVID-19	30/01/2020
Qatar	CT	31/12/2006
	VAT	
	COVID-19	30/01/2020
Oman	CT	31/12/2003
	VAT	01/04/2021
	COVID-19	30/01/2020
Bahrain	CT	
	VAT	01/06/2019

	COVID-19	30/01/2020

3.1.2 Standard Vector Auto-regression (VAR) Model

Multivariate time series are analyzed with VAR models (vector autoregressive models). There is a structure in which the variables are linear functions of past lags themselves and past lags of the other variables. As an example, consider the vector autoregressive model of order 1, denoted VAR (1):

Equation 3: Standard Vector Auto-regression Model

$$x_{t,1} = \alpha_1 + \phi_{11}x_{t-1,1} + \phi_{12}x_{t-1,2} + \phi_{13}x_{t-1,3} + w_{t,1} \quad (3)$$

$$x_{t,2} = \alpha_2 + \phi_{21}x_{t-1,1} + \phi_{22}x_{t-1,2} + \phi_{23}x_{t-1,3} + w_{t,2}$$

$$x_{t,3} = \alpha_3 + \phi_{31}x_{t-1,1} + \phi_{32}x_{t-1,2} + \phi_{33}x_{t-1,3} + w_{t,3}$$

While X1, X2, and X3 are index returns, exchange returns, and oil returns for each country. In addition, dummy variables can add to the equation as X4, X5, and X6 to investigate the impact of these events on these three variables for each country. Vector Auto-regression is based on the idea that each time series influences the others. This means the series can be predicted based on its past values and the past values of others in the system. Before building a model, Granger's Causality Test can be used to test this relationship (Prabhakaran, 2022).

3.2 Data Collection

3.2.1 Variables

The study includes six GCC; Saudi Arabia, United Arab Emirates, Kuwait, Qatar, Oman, and Bahrain. Each country has three variables; daily index return, daily exchange return, and daily oil return.

Daily index return is calculated using the daily return formula; ln (Pt/Pt-1), Pt is the index's price today, and Pt-1 was the index's price yesterday. Additionally, daily exchange return is calculated for EUR with each local currency price converted to return using the same formula as daily index return. Oil price is listed in the stock market by USD price, so first, it's required to

convert USD price to local price by using daily USD/ (SAR, AED, KWD, QAR, OMR OR BHD) price and multiplying it with USD oil price then calculate daily oil return. Saudi Arabia's data is from Oct 21, 1998, to Feb 10, 2022. United Arab Emirates data is from Aug 29, 2005, to Feb 10, 2022. Kuwait data from Dec 1, 2022. Qatar data is from Dec 31, 2001, to Feb 10, 2022. Oman data is from Dec 22, 2000, to Feb 10, 2022. Bahrain data is from Jun 1, 2014, to Feb 10, 2022.

This research will deal with each country's time series data for three different events considered dummy variables (Corporate Tax, VAT, and COVID-19). The following table represents each country's variables and the time of each event that occurred in each country:

Table 2: GCC variables

	Variables
SA	TASI Index Return
	EUR/SAR Return
	Oil Return
UAE	ADXG Index Return
	EUR/AED Return
	Oil Return
Kuwait	BKA Index Return
	EUR/KWD Return
	Oil Return
Qatar	QSI Index Return
	EUR/QAR Return
	Oil Return
Oman	MSM Index Return
	EUR/OMR Return
	Oil Return
Bahrain	BAX Index Return
	EUR/BHD Return
	Oil Return

3.2.2 Dummy variable:

Table 3: GCC dummy variables

	Event	Before	Event Time	After
SA	CT	21/10/1998	31/12/1999	31/12/2004
	VAT	01/01/2013	01/01/2018	10/02/2022
	COVID-19	01/12/2014	30/01/2020	10/02/2022
UAE	CT	29/08/2005	31/12/2008	31/12/2013
	VAT	01/01/2013	01/01/2018	10/02/2022

	COVID-19	01/12/2014	30/01/2020	10/02/2022
Kuwait	CT	-	31/12/2006	-
	VAT	-	-	-
	COVID-19	01/12/2014	30/01/2020	10/02/2022
Qatar	CT	31/12/2001	31/12/2006	31/12/2011
	VAT	-	-	-
	COVID-19	01/12/2014	30/01/2020	10/02/2022
Oman	CT	22/12/2000	31/12/2003	31/12/2008
	VAT	01/04/2016	01/04/2021	10/02/2022
	COVID-19	01/12/2014	30/01/2020	10/02/2022
Bahrain	CT	-	-	-
	VAT	01/06/2014	01/06/2019	10/02/2022
	COVID-19	01/12/2014	30/01/2020	10/02/2022

The table shows that each country has a different time for the same event, and some countries like Kuwait and Qatar did not apply VAT, and Bahrain did not apply corporate taxes. However, COVID-19 is a pandemic that has publicly announced as pandemic on June 30, 2020. This data was collected from the Bloomberg database and Investing.com, providing the most accurate and detailed information on the GCC economy.

Chapter Four- Results and Discussion

4.1 Preliminary Analysis

4.1.1 Plot

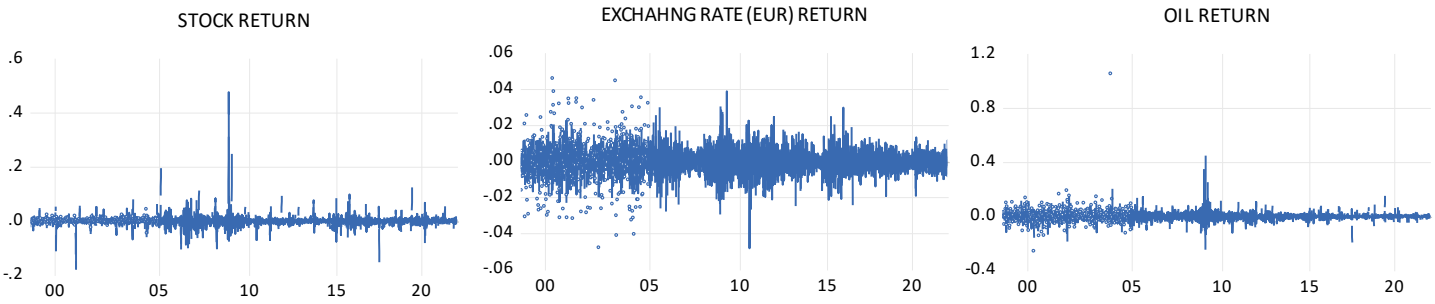

Figure1 4 Saudi Arabia Variables

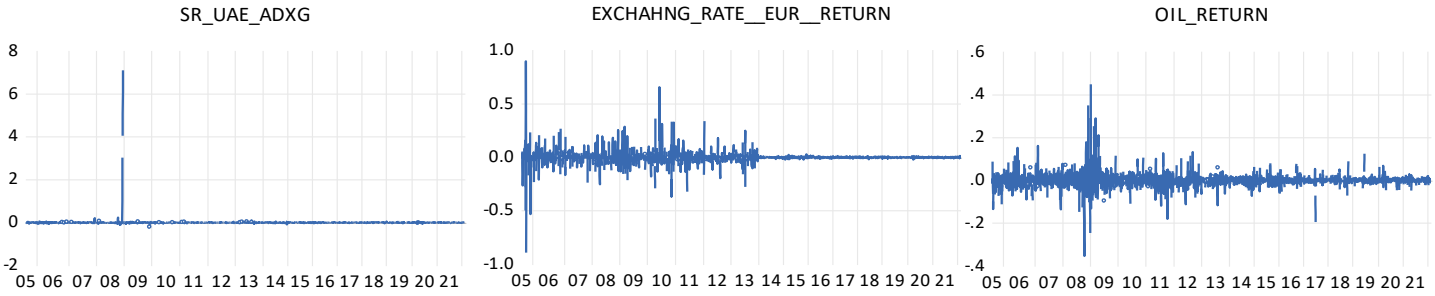

Figure1 5 United Arab Emirates Variables

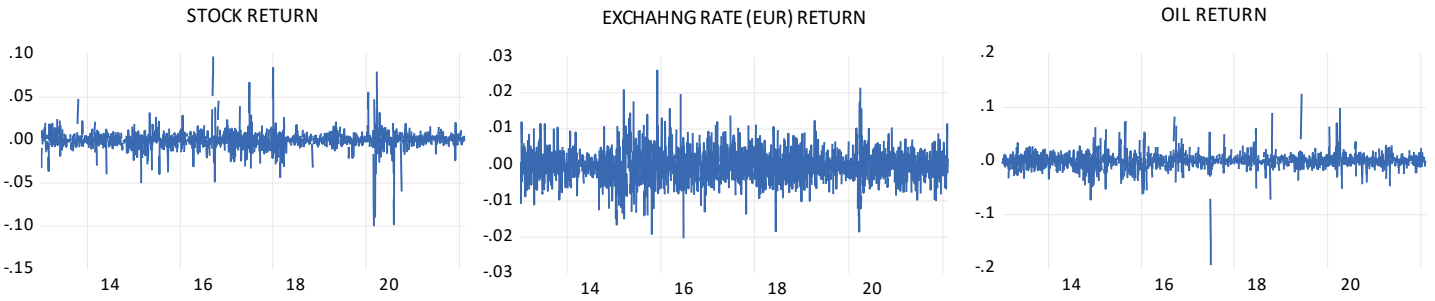

Figure1 6 Kuwait Variables

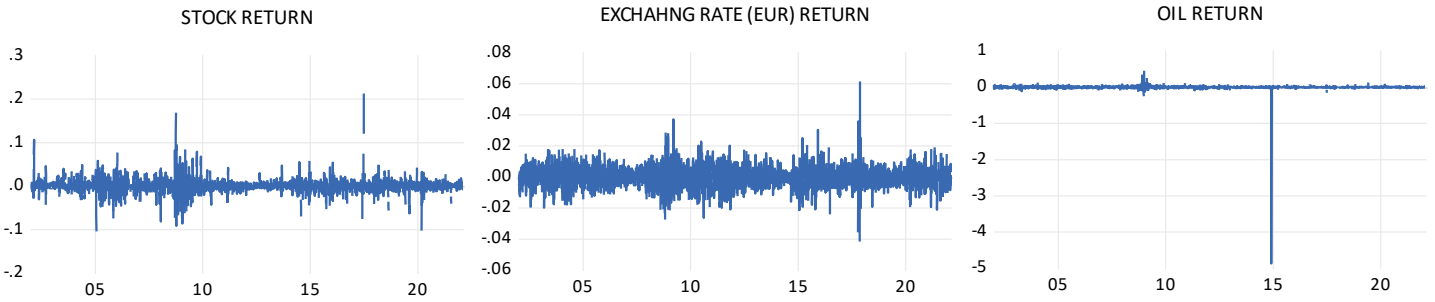

Figure1 7 Qatar Variables

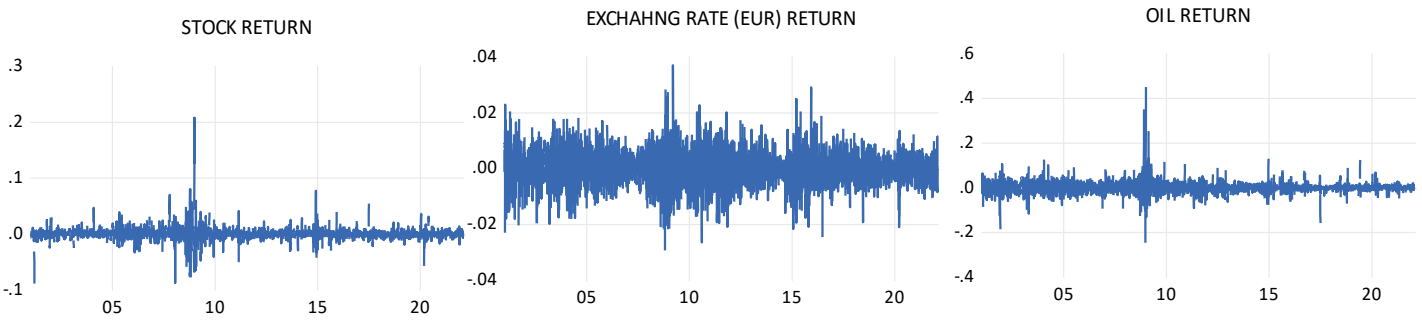

Figure1 8 Oman Variables

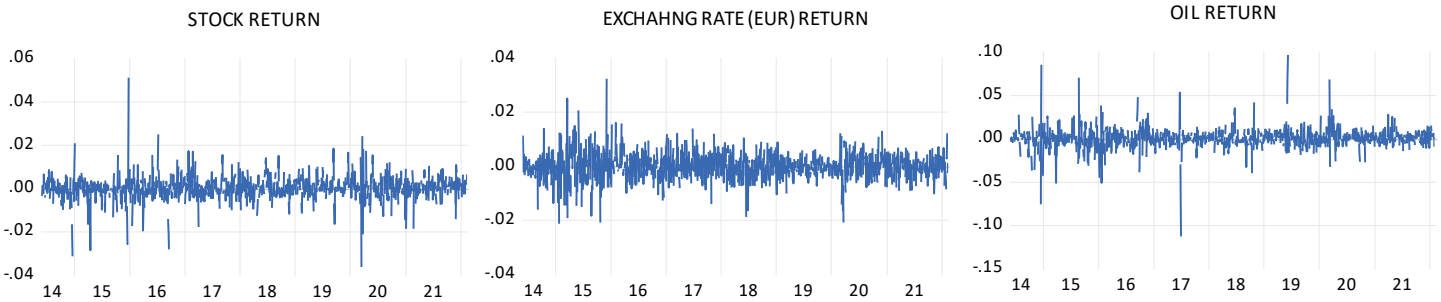

Figure1 9 Bahrain Variables

These graphs represent each country's variables; index return of each country's daily index return, exchange return, and oil return. The charts show that the exchange return for all GCC has more volatility than index return and oil return. Time series plots of data series. This graph is plotted by computing the index's returns, exchange with EUR, and oil for each country alone. For all, the return series exhibit volatility clustering, and their trend is stationary.

4.1.2 Descriptive Analysis

Table 4: GCC Descriptive Analysis

Country	Saudi Arabia			UAE		
Date	Sample: 10/21/1998 2/10/2023			Sample: 8/29/2005 2/10/2022		
Variable	ER	OR	SR	ER	OR	SR
Mean	-1.89E-05	0.001791	0.001275	0.000489	0.000660	0.007949
Median	3.98E-05	0.001296	0.000924	7.36E-05	0.000750	0.000379
Maximum	0.045957	1.053554	0.478070	0.898302	0.450035	7.116995
Minimum	-0.048122	-0.258614	-0.17562	-0.889897	-0.353054	-0.224136
Std. Dev.	0.007303	0.032418	0.019081	0.047823	0.030458	0.197484

Skewness	-0.089521	7.359305	6.489237	0.904483	1.344359	28.57959
Kurtosis	7.210715	228.7616	146.2746	99.82835	39.47143	876.9647
Jarque-Bera	3893.618	11220166	4536750.	1452964.	207184.7	1.19E+08
Probability	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Sum	-0.09952	9.423941	6.710250	1.817075	2.454363	29.55370
Sum Sq. Dev.	0.280562	5.527986	1.915053	8.500931	3.448324	144.9630
Observations	5261	5261	5261	3718	3718	3718

Country	Kuwait			Qatar		
Date	Sample: 1/02/2013 2/10/2022			Sample: 1/03/2002 2/10/2022		
Variable	ER	OR	SR	ER	OR	SR
Mean	-5.92E-05	0.000818	0.000389	0.000103	2.34E-05	0.000674
Median	0.000000	0.000868	0.000340	6.96E-05	0.001171	0.000547
Maximum	0.026245	0.125546	0.097556	0.061451	0.450307	0.212668
Minimum	-0.020352	-0.19371	-0.099984	-0.04154	-4.87055	-0.104127
Std. Dev.	0.004568	0.016054	0.011353	0.006247	0.079115	0.014729
Skewness	0.140924	-0.799686	-0.1439	0.184442	-55.53013	1.505567
Kurtosis	5.112752	25.90703	22.90824	7.494295	3424.653	29.40531
Jarque-Bera	360.8026	41875.62	31482.43	3556.041	2.05E+09	123515.5
Probability	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Sum	-0.112751	1.558288	0.741377	0.431354	0.098156	2.829183
Sum Sq. Dev.	0.039744	0.490968	0.245543	0.163756	26.26353	0.910299
Observations	1906	1906	1906	4197	4197	4197

Country	Oman			Bahrain		
Date	Sample: 12/22/2000 2/10/2022			Sample: 6/01/2014 2/10/2023		
Variable	ER	OR	SR	ER	OR	SR
Mean	0.000350	7.18E-05	0.001108	-6.35E-05	0.000825	0.000380
Median	0.000166	0.000000	0.001014	0.000000	0.000820	0.000286
Maximum	0.208005	0.037030	0.450307	0.032257	0.096943	0.051187
Minimum	-0.088807	-0.029199	-0.246094	-0.021243	-0.112363	-0.036174
Std. Dev.	0.010205	0.006004	0.024906	0.005121	0.012204	0.005610
Skewness	2.309471	-0.011159	2.344154	0.118427	-0.054106	0.033261
Kurtosis	64.86900	4.790357	49.43380	5.926204	19.53916	13.83247
Jarque-Bera	706952.7	588.8129	400040.4	433.8113	1368.96	5906.461
Probability	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Sum	1.542250	0.316592	4.885222	-0.076655	0.996406	0.458771
Sum Sq. Dev.	0.458920	0.158858	2.733703	0.031650	0.179777	0.037993
Observations	4408	4408	4408	1208	1208	1208

The summary of Saudi Arabia's descriptive statistics indicates that the average exchange return (the proxy of risk aversion) is -1.89E-05 percent, with a maximum return of 0.0459 percent and a minimum of -0.0481percent. Moreover, the mean oil return is 0.00179 percent, with a total return of 1.054 percent and a minimum of -0.259 percent. However, the mean index return is 0.001275 percent, with a maximum return of 0.478 percent and a minimum of -0.175 percent. The variables of Saudi Arabia rank based on more risky variables, which have the highest standard deviation are; oil return, index return then exchange return. The rest of the tables represent the mean, median, maximum, and minimum values of each variable for each country.

4.1.2.1 Standard Deviation:

The following information is the ranking of standard deviation from high risk to low risk. Ranking of UAE and Oman standard deviation; index return, exchange return, and then oil return. However, Kuwait, Qatar, and Bahrain's standard deviations are; oil return, index return, and exchange return.

4.1.2.2 Skewness

In terms of skewness, the analysis shows a negative skewness for the exchange return of Saudi Arabia, oil return and index return of Kuwait, and oil return of Qatar, Oman, and Bahrain. This variable's skewness is to the left tail of the distribution curve. Also, the rest of the variables of each country that are not mentioned in the negative tail have positive skewness. This variable's skewness is to the right-tail of the distribution curve.

4.1.2.3 Jarque-Bera test

Based on the Jarque-Bera test, which checks for normality, the results of this study indicate that the data are not normal (concerning the residuals). Further, Jarque-Bera handles a wide variety of data. (Probability and Statistics Topic Index, 2021). This test has the following null and alternative hypotheses:

- *H0: The data is normally distributed.*
- *H1: The data is not normally distributed.*

The results of the Jarque-Bera test of all GCCs variables show that the p-value is less than 0.05 for all variables under consideration for the sample, so the null hypothesis is rejected. Data series residuals are not normally distributed, as indicated by this result.

4.1.3 Correlation Analysis

Correlation analysis describes the relationship between two variables. A low correlation between the variables is essential for accurate estimation, as multicollinearity can arise when one or more variables are highly correlated. Based on (Gujarati, D. and Porter, D. (2004)) a correlation with a value of * 0.90 or higher indicates multicollinearity between the variables, and one or both must be excluded from the model.

Table 5: Saudi Arabia Variables Correlations

SA-CORRELATION	SR	ER	OR
SR	1.000000	-0.013444	0.037708
ER	-0.013444	1.000000	0.070683
OR	0.037708	0.070683	1.000000

Table 6: UAE Variables Correlations

UAE-CORRELATION	SR	ER	OR
SR	1.000000	-0.008996	-0.010375
ER	-0.008996	1.000000	-0.014491
OR	-0.010375	-0.014491	1.000000

Table 7: Kuwait Variables Correlations

KUWAIT-CORRELATION	SR	ER	OR
SR	1.000000	0.063432	0.059367
ER	0.063432	1.000000	-0.019640
OR	0.059367	-0.019640	1.000000

Table 8: Qatar Variables Correlations

QATAR-CORRELATION	SR	ER	OR
SR	1.000000	-0.014607	0.004635
ER	-0.014607	1.000000	0.049192
OR	0.004635	0.049192	1.000000

Table 9: Oman Variables Correlations

OMAN- CORRELATION	SR	ER	OR
SR	1.000000	-0.043210	0.143459
ER	-0.043210	1.000000	0.104955
OR	0.143459	0.104955	1.000000

Table 10: Bahrain Variables Correlations

BAHRAIN-CORRELATION	SR	ER	OR
SR	1.000000	0.011907	-0.034519
ER	0.011907	1.000000	-0.081841
OR	-0.034519	-0.081841	1.000000

According to the correlation analysis, all variables have low correlations with each other. Looking at the correlation of the variables of Saudi Arabia's index return has a negative correlation with exchange return and a positive correlation with oil return. There is a positive correlation between exchange return and oil return. However, all three variables of UAE have a negative correlation among all of them. Although Kuwait has a negative correlation between exchange return and oil return, the index return positively correlates with oil return and exchange return. Additionally, Qatar and Oman have a negative correlation between index return and exchange return, and the oil return has a positive correlation between index and exchange return. Bahrain has a positive correlation between index return and exchange return, and the oil return has a negative correlation between index and exchange return. These correlations strongly support using the variables because there is no multicollinearity among the variables.

4.1.4 Unit Root Test

This study uses the Augmented Dickey-Fuller test (ADF) and Phillips- Perronunit Test to examine the stationarity of the data series (Granger & Newbold, 1974). The null hypothesis and alternative hypothesis for the ADF and PPT test are:

- H_0 = *data series has a unit root and is non-stationary.*
- H_1 = *data series does not have a unit root and is stationary.*

Table 11: Unit Root Test of GCC Variables

Unit Root Test			**Country**					
Test Type	Test for unit in	variable	**Saudi Arabia**	**UAE**	**Kuwait**	**Qatar**	**Oman**	**Bahrain**
Augmented Dickey–Fuller Test	level	**Exchange return**	0.0001	0.0000	0.0001	0.0001	0.0001	0.0000
		Oil return	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000
		Index return	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000
	level	**Exchange return**	0.0001	0.0000	0.0001	0.0001	0.0001	0.0000

Phillips-Perronunit Test		**Oil return**	0.0001	0.0000	0.0000	0.0001	0.0001	0.0000
		Index return	0.0001	0.0000	0.0000	0.0001	0.0000	0.0000

The unity root test is a test of the stationarity of data. According to the unit root test, all variables' data for each country are stationary at a level. The p-value for all variables for all GCC is less than 0.05. Based on the result, the null hypothesis is rejected, according that those data series are stationary

4.1.5 Cointegration Test

Using Johansen System Cointegration Test, the study examines the cointegration of the data series. (Hjalmarsson & Österholm, 2007). The null hypothesis and alternative hypothesis are:

- *H_0= Data series is not cointegrated*
- *H_1- Data series is cointegrated*

All variables Trace test indicates three cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values.

Unrestricted Cointegration Rank Test (Trace)							
country	No. of CE(s)	Trace Statistic	0.05Critical Value	Prob.**	Max-Eigen Staristic	0.05Critical Value	Prob.**
	None *	2729.06	29.80	0.0000	1107.02	21.13	0.0000
	At most 1 *	1622.04	15.49	0.0000	907.01	14.26	0.0000
SA	At most 2 *	715.03	3.84	0.0000	715.03	3.84	0.0000
	None *	1772.76	29.80	0.0000	741.94	21.13	0.0000
	At most 1 *	1030.82	15.49	0.0000	599.94	14.26	0.0000
UAE	At most 2 *	430.87	3.84	0.0000	430.87	3.84	0.0000
	None *	909.81	29.80	0.0000	370.05	21.13	0.0000
	At most 1 *	539.76	15.49	0.0000	279.57	14.26	0.0000
Kuwait	At most 2 *	260.19	3.84	0.0000	260.19	3.84	0.0000
	None *	2264.62	29.80	0.0000	813.03	21.13	0.0000
	At most 1 *	1451.59	15.49	0.0000	768.13	14.26	0.0000
Qatar	At most 2 *	683.46	3.84	0.0000	683.46	3.84	0.0000
	None *	2501.91	29.80	0.0000	904.54	21.13	0.0000
	At most 1 *	1597.37	15.49	0.0000	833.90	14.26	0.0000
Oman	At most 2 *	763.48	3.84	0.0000	763.48	3.84	0.0000
Bahrain	None *	650.95	29.80	0.0000	254.14	21.13	0.0000

	At most 1 *	396.82	15.49	0.0000	229.67	14.26	0.0000
	At most 2 *	167.15	3.84	0.0000	167.15	3.84	0.0000

As determined by Trace and Max-Eigen cointegration tests, three cointegrating equations have test p-values less than 0.05 for these data series. The null hypothesis is thus rejected since the data are cointegrated. The VAR model can be built with level series since cointegration equations exist between the variables.

4.2 Empirical result

4.2.1 Event Study and Standard vector Auto-regression model

The following table represents that VAR studied the long time impact while event study studied the short time impact. The t-State hypothesis represents the significance:

- *H_0: Data series is not substantial when the t-state is less than 2*
- *H_1:Data series is significant when the t-state is more than 2*

, while the p-value represent the stationarity of the data, and its hypothesis is:

- *H_0: Data series is not stationary when the p-value is more than 5%*
- *H_1:Data series is stationary when the p-value is less than 5%*

The p-value of VAR is estimated by using VAR Granger Causality/Block Exogeneity Wald Tests.

Table 12: Saudi Arabia Event Study and VAR

		country	SA								
		event	CT			VAT			COVID-19		
		variable	IR	ER	OR	IR	ER	OR	IR	ER	OR
Short term	event study	t-stat (CAR)	0.54	(1.05)	(0.29)	3.05	1.88	(0.50)	(2.59)	(2.34)	0.41
		t-stat(BHAR)	0.44	(1.05)	(0.41)	3.17	1.89	(0.52)	(2.76)	(2.33)	0.31
Long term	VAR	t-stat	0.57	(0.35)	(2.08)	(0.12)	(0.53)	0.26	0.51	(0.02)	(0.16)
Short term	event study	P-VALUE(CAR)	0.59073	0.30084	0.77128	0.00368	0.06614	0.61869	0.0124	0.02346	0.68560
		P-VALUE(BHAR)	0.65950	0.29762	0.68446	0.00266	0.06472	0.60868	0.0082	0.02389	0.75605
Long term	VAR	P- VALUE	0.84610	0.04120	0.05710	0.93410	0.57960	0.81360	0.86450	0.90360	0.84880

In Saudi Arabia, the data represent that all variables are insignificant and not stationary at the corporate tax period in the two models. This means that corporate tax has no impact on these three variables in the short and long term.

Otherwise, index return is significant and stationary during the VAT period in the event study but not significant and not stationary in the long term. This means that VAT impacts the index return in the short time but has no impact in the long term. The data represent that exchange return and oil return are insignificant and not stationary at the VAT period in the two models. This means that VAT has no impact on exchange return and oil return in both short and long terms.

Additionally, index return and exchange return are significant and stationary during the COVID-19 period in the event study but not significant and not stationary in the long term. This means that COVID-19 impacts the index return and exchange return in the short term but has no impact in the long term. The data represent that oil return is insignificant and not stationary during the COVID-19 period in the two models. This means that COVID-19 has no impact on oil return in both short and long terms.

Table 13: UAE Event Study and VAR

		country	UAE								
		event	CT			VAT			COVID-19		
		variable	IR	ER	OR	IR	ER	OR	IR	ER	OR
Short term	event study	t-stat (CAR)	(2.26)	0.14	1.55	0.47	1.88	(0.52)	(1.55)	(2.53)	0.86
		t-stat(BHAR)	(1.42)	(0.10)	2.33	0.46	1.89	(0.53)	(1.47)	(2.52)	0.74
Long term	VAR	t-stat	-0.37	0.25	8.46	-0.02	-0.11	0.31	-0.01	-0.02	0.33
Short term	event study	P-VALUE(CAR)	0.0280	0.8897	0.1270	0.6412	0.0658	0.6061	0.1276	0.0147	0.3963
		P-VALUE(BHAR)	0.1610	0.9190	0.0239	0.6473	0.0643	0.5964	0.1486	0.0152	0.4616
Long term	VAR	P- VALUE	0.3428	0.9176	0.0000	0.9985	0.9612	0.8642	0.9993	0.9981	0.9275

In UAE, index return is significant and stationary during the corporate tax period in the event study only in CAR but not substantial and not stationary in the long term. This means that VAT impacts the index return in the short term but has no impact in the long term. However, oil return is significant and stationary during corporate tax period in the event study only in BHAR

and significant and stationary at VAR. This means that corporate tax impacts the oil return in the short term and long term.

The data represent that all variables are insignificant and not stationary at the VAT period in the two models. This means that VAT has no impact on these three variables in both the short term and long term.

Otherwise, exchange return is significant and stationary at the COVID-19 period in the event study but not significant and not stationary in the long term. This means that COVID-19 impacts the exchange return in the short term but has no impact in a long time. The data represent that index return and oil return are insignificant and not stationary during the COVID-19 period in the two models. This means that COVID-19 has no impact on index and oil returns in both short and long terms.

Table 14: Kuwait Event Study and VAR

		country	KUWAIT		
		event	COVID-19		
		variable	IR	ER	OR
Short term	event study	t-stat (CAR)	(0.20)	(1.93)	1.38
		t-stat(BHAR)	(0.17)	(1.96)	1.26
Long term	VAR	t-stat	-0.59	-0.17	0.62
Short term	event study	P- VALUE(CAR)	0.8426	0.0597	0.1750
		P- VALUE(BHAR)	0.8672	0.0557	0.2135
Long term	VAR	P- VALUE	0.8341	0.9568	0.5053

In Kuwait, exchange return is significant and stationary during the COVID-19 period in the event study but not significant and not stationary in the VAR model. This means that COVID-19 impacts the exchange return in the short term but has no impact in the long term. The data represent that index return, and oil return are not significant and not stationary during the COVID-19 period in the two models. This means that COVID-19 has no impact on index and oil returns in both short and long terms.

Table 15: Qatar Event Study and VAR

		country	QATAR					
		event	CT			COVID-19		
		variable	IR	ER	OR	IR	ER	OR

		t-stat (CAR)	(0.89)	1.64	2.31	(0.75)	(2.03)	1.11
Short term	event study	t-stat(BHAR)	(0.92)	1.64	2.63	(0.75)	(2.16)	1.04
Long term	VAR	t-stat	0.23	0.93	0.17	0.02	(0.07)	0.09
		P- VALUE(CAR)	0.3783	0.1083	0.0250	0.4581	0.0482	0.2724
Short term	event study	P- VALUE(BHAR)	0.3614	0.1067	0.0114	0.4556	0.0360	0.3020
Long term	VAR	P- VALUE	0.6235	0.1245	0.7735	0.9903	0.9644	0.8770

In Qatar, oil return is significant and stationary during the corporate tax period in the event study but not significant and not stationary in the VAR model. This means that corporate tax impacts the oil return in the short term but has no impact in a long time. The data represent that index return and exchange return are insignificant and not stationary during the corporate tax period in the two models. This means that corporate tax has no impact on index return and exchange return in both short and long terms.

In addition, exchange return is significant and stationary during the COVID-19 period in the event study but not significant and not stationary in the VAR model. This means that COVID-19 impacts the exchange return in the short term but has no impact in a long time. The data represent that index return and oil return are insignificant and not stationary during the COVID-19 period in the two models. This means that COVID-19 has no impact on index return and oil return in both the short term and long term.

Table 16: Oman Event Study and VAR

		country	OMAN								
		event	CT			VAT			COVID-19		
		variable	IR	ER	OR	IR	ER	OR	IR	ER	OR
		t-stat (CAR)	2.31	1.19	1.65	2.80	(1.52)	0.50	(0.23)	(2.61)	0.87
Short term	event study	t-stat(BHAR)	2.38	1.21	1.86	2.86	(1.50)	0.45	(0.15)	(2.61)	0.76
Long term	VAR	t-stat	(0.33)	(0.75)	(1.09)	(1.60)	(0.25)	(0.40)	(0.64)	(0.13)	0.30
		P-VALUE(CAR)	0.0253	0.2409	0.1056	0.0072	0.1344	0.6221	0.8185	0.0119	0.3885
Short term	event study	P-VALUE(BHAR)	0.0211	0.2319	0.0694	0.0061	0.1410	0.6556	0.8775	0.0121	0.4515
Long term	VAR	P- VALUE	0.7563	0.153	0.4056	0.2703	0.8909	0.9116	0.7856	0.9888	0.8982

In Oman, index return is significant and stationary during the corporate tax period in the event study but not significant and not stationary in the VAR model. This means that corporate tax impacts the Index return in the short term but has no impact in a long time. The data represent that exchange and oil returns are insignificant and not stationary during the corporate tax period in the two models. This means that corporate tax has no impact on exchange return and oil return in both short and long terms.

Although, the index return is significant and stationary during the VAT period in the event study but not significant and not stationary in the long term. This means that VAT impacts the index return in the short term but has no impact in the long term. The data represent that exchange return, and oil return are not significant and not stationary during the VAT period in the two models. This means that VAT has no impact on exchange return and oil return in both short term and long term.

However, exchange return is significant and stationary during the COVID-19 period in the event study but not significant and not stationary in the VAR model. This means that COVID-19 impacts the exchange return in the short term but has no impact in the long term. The data represent that index return and oil return are insignificant and not stationary during the COVID-19 period in the two models. This means that COVID-19 has no impact on index and oil returns in both short and long terms.

Table 17: Bahrain Event Study and VAR

		country	BAHRAIN					
		event	VAT			COVID-18		
		variable	IR	ER	OR	IR	ER	OR
		t-stat (CAR)	(0.21)	(1.11)	2.44	0.34	(1.16)	0.81
Short term	event study	t-stat(BHAR)	(0.21)	(1.10)	2.49	0.46	(1.13)	2.27
Long term	VAR	t-stat	0.41	(0.53)	5.14	0.21	(0.06)	(0.28)
		P- VALUE(CAR)	0.8364	0.2730	0.0185	0.7383	0.2500	0.4203
Short term	event study	P-VALUE(BHAR)	0.8371	0.2759	0.0162	0.6449	0.2654	0.0279
Long term	VAR	P- VALUE	0.6584	0.8598	0	0.9419	0.998	0.8552

In Bahrain, oil return is significant and stationary at VAT period in the event study and VAR. This means that VAT impacts the index return in the short and long term. The data represent

that index return, and exchange return is insignificant and not stationary during the VAT period in the two models. This means that VAT has no impact on index return and exchange return in both short and long terms.

Additionally, the data represent that all variables are not significant and not stationary at the COVID-19 period in the two models. This means that COVID-19 has no impact on these three variables in both the short term and long term.

4.2.2 Standard vector autoregression and VAR Granger Causality/Block Exogeneity Wald Tests

The reason for using the VAR model is to see the impact of the dummy variable on each variable and the effect of each variable on the other variables. In other words, The reason for using the VAR model is not only to see the impact of CT, VAT, and COVID-19 on index return, exchange return, and oil return but also to see the impact of these variables (index return, exchange return, and oil return) together.

Table 18: Saudi Arabia Standard vector auto regression and VAR Granger Causality/Block Exogeneity Wald Tests

COUNTRY	SA					
DEPENDEND V	IR		ER		OR	
INDEPENDEND V	ER	OR	IR	OR	IR	ER
T-STAT	[1.08896]	[2.89524]	[0.42144]	[-1.08310]	[0.06360]	[-2.84237]
P- VALUE	0.2149	0.014	0.6581	0.3823	0.9087	0.0071

Saudi Arabia variables, the Index return is dependent on the oil return but not with exchange return. However, the exchange return is not stationary and not significant with any Independent variables. The oil return is dependent on the exchange return. There is a negative relationship between oil return and exchange return.

Table 19: UAE Standard vector auto regression and VAR Granger Causality/Block Exogeneity Wald Tests

COUNTRY	UAE		
DEPENDEND V	IR	ER	OR

INDEPENDEND V	ER	OR	IR	OR	IR	ER
T-STAT	[-2.24198]	[2.78629]	[-0.85705]	[-1.88083]	[1.82051]	[-1.92875]
P- VALUE	0.0007	0	0.6525	0.1543	0.0556	0.0561

UAE, the Index return is dependent on the exchange return and oil return. There is a negative relationship between index return and exchange return. There is a positive relationship between index return and oil return. However, exchange return and oil return are not stationary and not significant with any Independent variables.

Table 20: Kuwait Standard vector auto regression and VAR Granger Causality/Block Exogeneity Wald Tests

COUNTRY	KUWAIT					
DEPENDEND V	IR		ER		OR	
INDEPENDEND V	ER	OR	IR	OR	IR	ER
T-STAT	[0.34830]	[1.92007]	[0.94550]	[-1.67246]	[-2.94595]	[-2.21184]
P- VALUE	0.9411	0.0798	0.1568	0.2321	0.0108	0.0231

Kuwait, index return, and exchange return are not stationary and insignificant with Independent variables. Although, the oil return is dependent on the exchange return. There is a negative relationship between oil return and exchange return.

Table 21: Qatar Standard vector auto regression and VAR Granger Causality/Block Exogeneity Wald Tests

COUNTRY	QATAR					
DEPENDEND V	IR		ER		OR	
INDEPENDEND V	ER	OR	IR	OR	IR	ER
T-STAT	[0.56301]	[0.31476]	[-0.58766]	[0.80324]	[0.73091]	[0.20269]
P- VALUE	0.1148	0.9185	0.7278	0.6634	0.4024	0.8579

Qatar, index return, exchange return, and oil return are not stationary and not significant with any Independent variables.

Table 22: Oman Standard vector auto regression and VAR Granger Causality/Block Exogeneity Wald Tests

COUNTRY	OMAN		
DEPENDEND V	IR	ER	OR

INDEPENDEND V	ER	OR	IR	OR	IR	ER
T-STAT	[1.69253]	[2.59304]	[-1.18726]	[-0.55049]	[6.65346]	[-2.95010]
P- VALUE	0.0678	0.0005	0.4405	0.5792	0	0.0127

In Oman, the Index return is dependent on the exchange return. There is a positive relationship between index return and oil return. Exchange return is not stationary and not significant with any Independent variables. Although, the oil return is dependent on the exchange return. There is a negative relationship between oil return and exchange return.

Table 23: Bahrain Standard vector auto regression and VAR Granger Causality/Block Exogeneity Wald Tests

COUNTRY	BAHRAIN					
DEPENDEND V	IR		ER		OR	
INDEPENDEND V	ER	OR	IR	OR	IR	ER
T-STAT	[0.41720]	[0.64632]	[1.37539]	[-0.36962]	[-3.04479]	[-0.49017]
P- VALUE	0.8738	0.5091	0.2745	0.8572	0.0052	0.4934

Bahrain, index return, and exchange return are not stationary and insignificant with Independent variables. Although, the oil return is dependent on the index return. There is a negative relationship between oil return and index return.

4.2.3 Impulse Response

Impulse response allows to trace out the time path of the variables in the model to the one unit raise in the current value of one VAR error. However, the impulse response is applied in the main matrix in Eviews. The following figures represent the impact of each variable on the others. The magnitude of the shock is one standard deviation shock. However, red dots are the standard error confidence bands. This confidence interval is computed by +/- 2SE confidence bands; and X-axis represents the period (daily), and the Y represents the variation in percentage (Stock & Watson, 2001).

For Saudi Arabia, the shock of index return is one standard deviation shock on index return (response of index return to index return). In addition, the shock of exchange return is one standard deviation shock on index return (response of index return to exchange return). Also, the shock of oil return is one standard deviation shock on index return (response of index return to oil return). Figure1 10 represents Saudi Arabia's impulse response; the results suggest that Index return creates

a steep decline effect. That can be interpreted as when a shock is introduced by Index return; the index returns will decrease sharply. This reaction will become safe after seven days. In addition, the results show that exchange return creates a transposed "U-shape". That can be interpreted as when a shock is introduced by exchange return; the index returns will increase on the first day and then decrease slightly up to the fifth day. The results show that oil return creates a transposed "U-shape". That can be interpreted as when a shock is introduced by oil return; the index returns will increase up to the fifth day.

The results show that index return creates a transposed "line shape" from an exchange return perspective". That can be interpreted as when a shock is introduced by index return; the exchange returns will stay stable. The results suggest that exchange return creates a steep decline effect. That can be interpreted as when a shock is introduced by exchange return; the exchange returns will decrease sharply. This reaction will become safe after four days. The results show that oil return creates a transposed "U-shape". That can be interpreted as when a shock is introduced by oil return; the exchange return will decrease on the second day, increase on the third, and rise after four days.

The results show that index return creates a transposed "U-shape" from the oil return perspective. That can be interpreted as when a shock is introduced by index return; the oil returns decrease on day one, then it will stay stable. The results show that exchange returns create a transposed "U-shape". That can be interpreted as when a shock is introduced by exchange return; the oil return will decrease in the first three days, increase on day four, and become stable. The results suggest that oil return creates a steep decline effect. That can be interpreted as when a shock is introduced by oil return; the oil returns will decrease sharply. This reaction will become safe after four days.

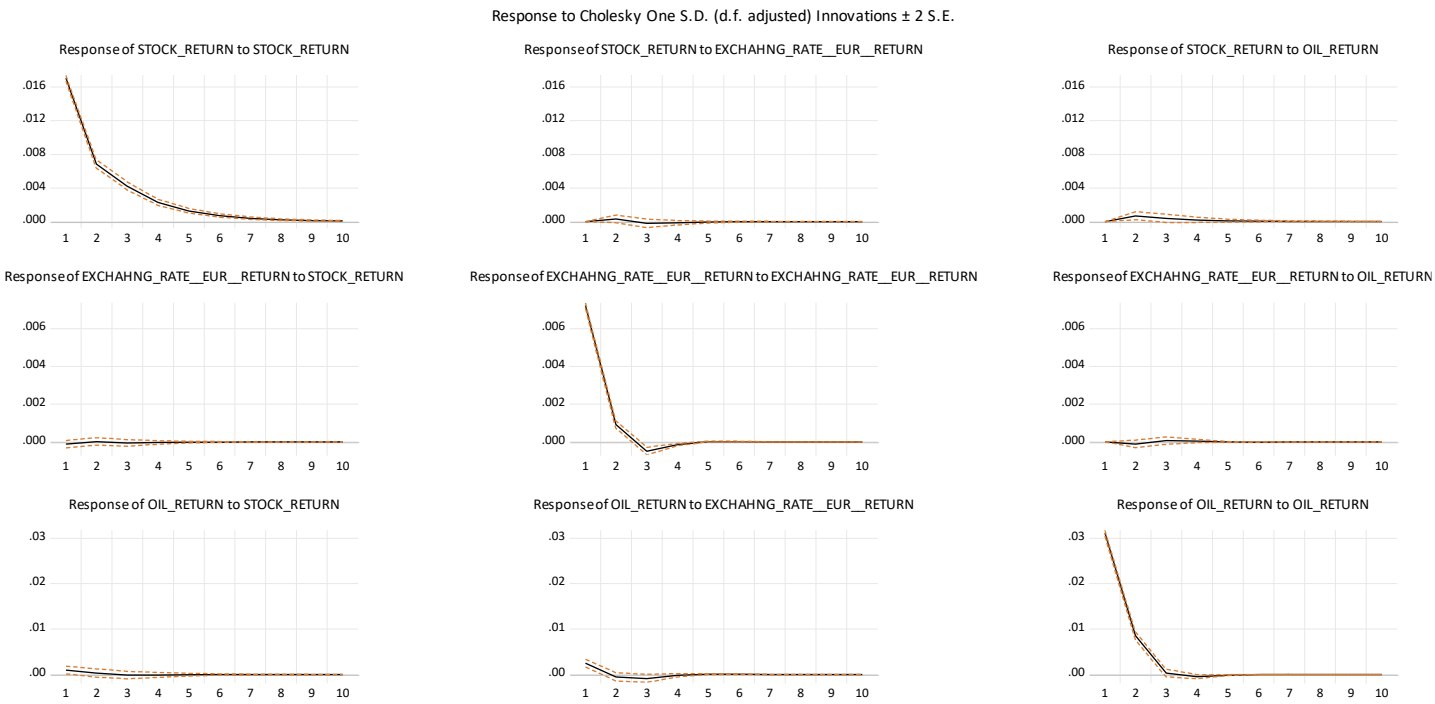

Figure1 10 Saudi Arabia Impulse Response

For UAE, the shock of index return is one standard deviation shock on index return (response of index return to index return). In addition, the shock of exchange return is one standard deviation shock on index return (answer of index return to exchange return). Also, the shock of oil return is one standard deviation shock on index return (response of index return to oil return).Figure1 11 represents UAE impulse response; the results suggest that Index return creates a steep decline effect. That can be interpreted as when a shock is introduced by Index return; the index returns will decrease sharply up to day ten. In addition, the results show that exchange return creats a transposed "U-shape". That can be interpreted as when a shock is introduced by exchange return; the index returns will decrease in the first two days and then increase up to day six, then become stable. The results show that oil return creates a transposed "U-shape". That can be interpreted as when a shock is introduced by oil return; the index returns will increase in the first two days then decrees slightly up to ten days.

From an exchange return perspective, the results show that index return creates a transposed "line shape". That can be interpreted as when a shock is introduced by index return; the exchange returns will stay stable. The results suggest that exchange return creates a steep decline effect. That can be interpreted as when a shock is introduced by exchange return; the exchange returns will

decrease sharply. This reaction will become safe after six days. The results show that oil return creates a transposed "line shape". That can be interpreted as when a shock is introduced by oil return; the exchange return will stay stable.

For the oil return perspective, the results show that index return creates a transposed "line shape". That can be interpreted as when a shock is introduced by index return; the oil returns will stay stable. The results show that exchange return creates a transposed "line shape". That can be interpreted as when a shock is introduced by exchange return; the oil return will stay stable. The results suggest that oil return creates a steep decline effect. That can be interpreted as when a shock is introduced by oil return; the oil returns will decrease sharply. This reaction will become safe after four days.

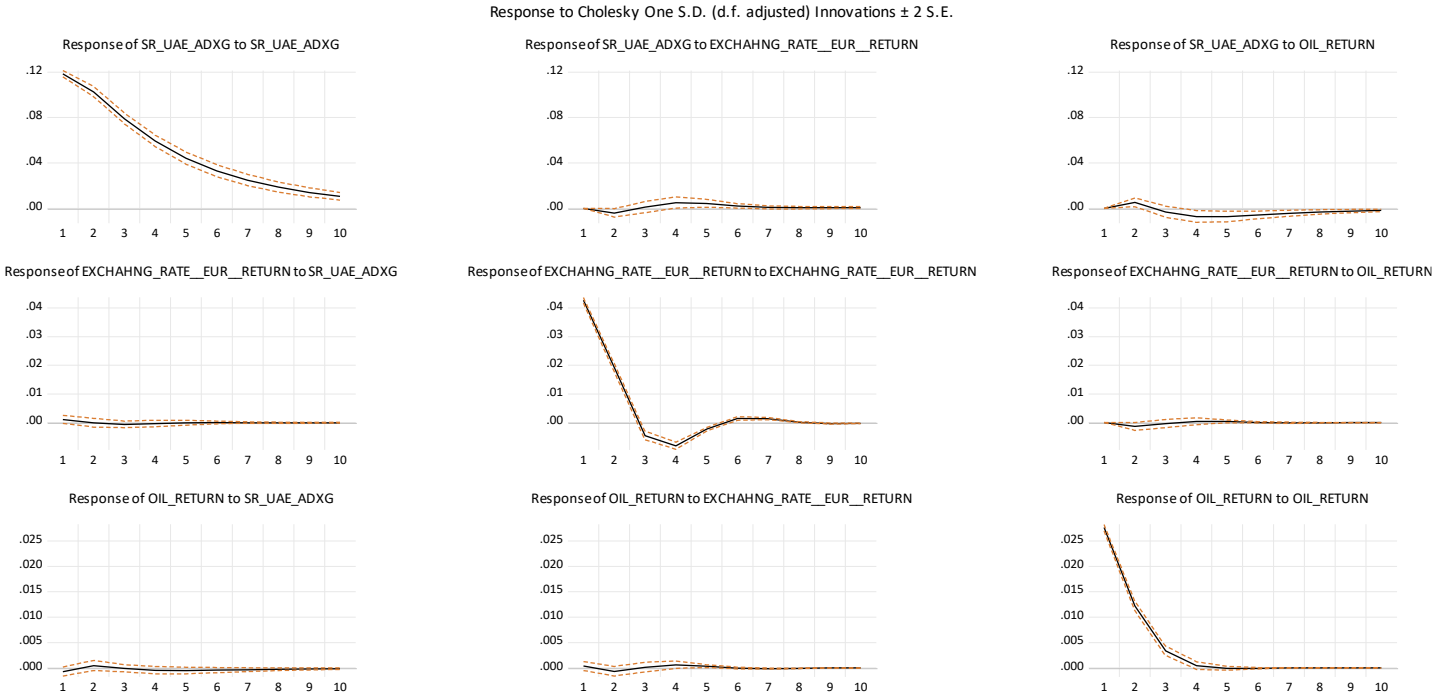

Figure1 11 UAE Impulse Response

For Kuwait, the shock of index return is one standard deviation shock on index return (response of index return to index return). In addition, the shock of exchange return is one standard deviation shock on index return (response of index return to exchange return). Also, the shock of oil return is one standard deviation shock on index return (response of index return to oil return). Figure1 12 represents Kuwait's impulse response; the results suggest that Index return creates a steep decline effect. That can be interpreted as when a shock is introduced by Index return; the index returns will decrease sharply. This reaction will become safe after five days. In addition, the results show

that exchange return creates a transposed "U-shape". That can be interpreted as when a shock is introduced by exchange return; the index returns will increase slightly in the first days and then becomes stable after day five. The results show that oil return creates a transposed "U-shape". That can be interpreted as when a shock is introduced by oil return; the index returns will increase slightly in the first days then becomes stable after day five

The results show that index return creates a transposed "U-shape" from an exchange return perspective. That can be interpreted as when a shock is introduced by index return, the exchange returns decrease on the second day, increase on the fourth day, and become stable. The results suggest that exchange return creates a steep decline effect. That can be interpreted as when a shock is introduced by exchange return; the exchange returns will decrease sharply. This reaction will become safe after three days. The results show that oil return creates a transposed "U-shape". That can be interpreted as when a shock is introduced by oil return; the exchange return will decrease on the second day, increase on the third and then increase after four days.

From an oil return perspective, the index return results create a transposed "U-shape ."That can be interpreted as when a shock is introduced by index return; the oil returns decrease on day two, then become stable. The results show that exchange returns create a transposed "U-shape". That can be interpreted as when a shock is introduced by exchange return; the oil return will decrease in the first three days, increase on day four, and become stable. The results suggest that oil return creates a steep decline effect. That can be interpreted as when a shock is introduced by oil return; the oil returns will decrease sharply. This reaction will become safe after five days.

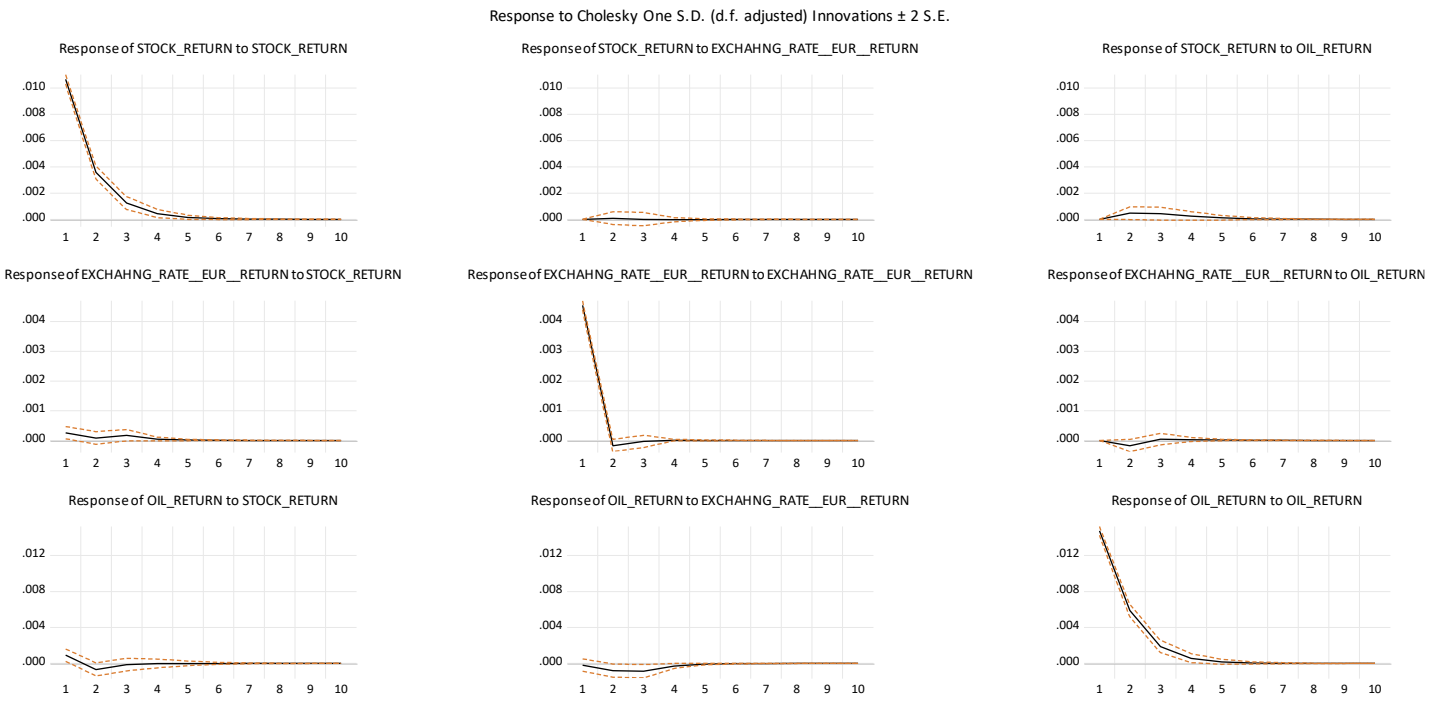

Figure1 12 Kuwait Impulse Response

For Qatar, the shock of index return is one standard deviation shock on index return (response of index return to index return). In addition, the shock of exchange return is one standard deviation shock on index return (response of index return to exchange return). Also, the shock of oil return is one standard deviation shock on index return (response of index return to oil return). Figure1 13 represents Qatar impulse response; the results suggest that Index return creates a steep decline effect. That can be interpreted as when a shock is introduced by Index return; the index returns will decrease sharply. This reaction will become safe after five days. In addition, the results show that exchange return creates a transposed "U-shape". That can be interpreted as when a shock is introduced by exchange return; the index returns will increase on day three and then become stable. The results show that oil return creates a transposed "line shape". That can be interpreted as when a shock is introduced by oil return; the index returns will stay stable.

The results show that index return creates a transposed "line-shape" from an exchange return perspective. That can be interpreted as when a shock is introduced by index return; the exchange returns will stay stable. The results suggest that exchange return creates a steep decline effect. That can be interpreted as when a shock is introduced by exchange return; the exchange returns will decrease sharply up to the second day and then becomes stable. This reaction will become safe

after three days. The results show that oil return creates a transposed "line shape". That can be interpreted as when a shock is introduced by oil return; the exchange return will stay stable.

The results show that index return creates a transposed "line shape" from an oil return perspective". That can be interpreted as when a shock is introduced by index return; the oil returns will become stable. The results show that exchange returns create a transposed "U-shape". That can be interpreted as when a shock is introduced by exchange return; the oil return will decrease in the first day and then become stable. The results suggest that oil return creates a steep decline effect. That can be interpreted as when a shock is introduced by oil return; the oil returns will decrease sharply. This reaction will become safe after day two.

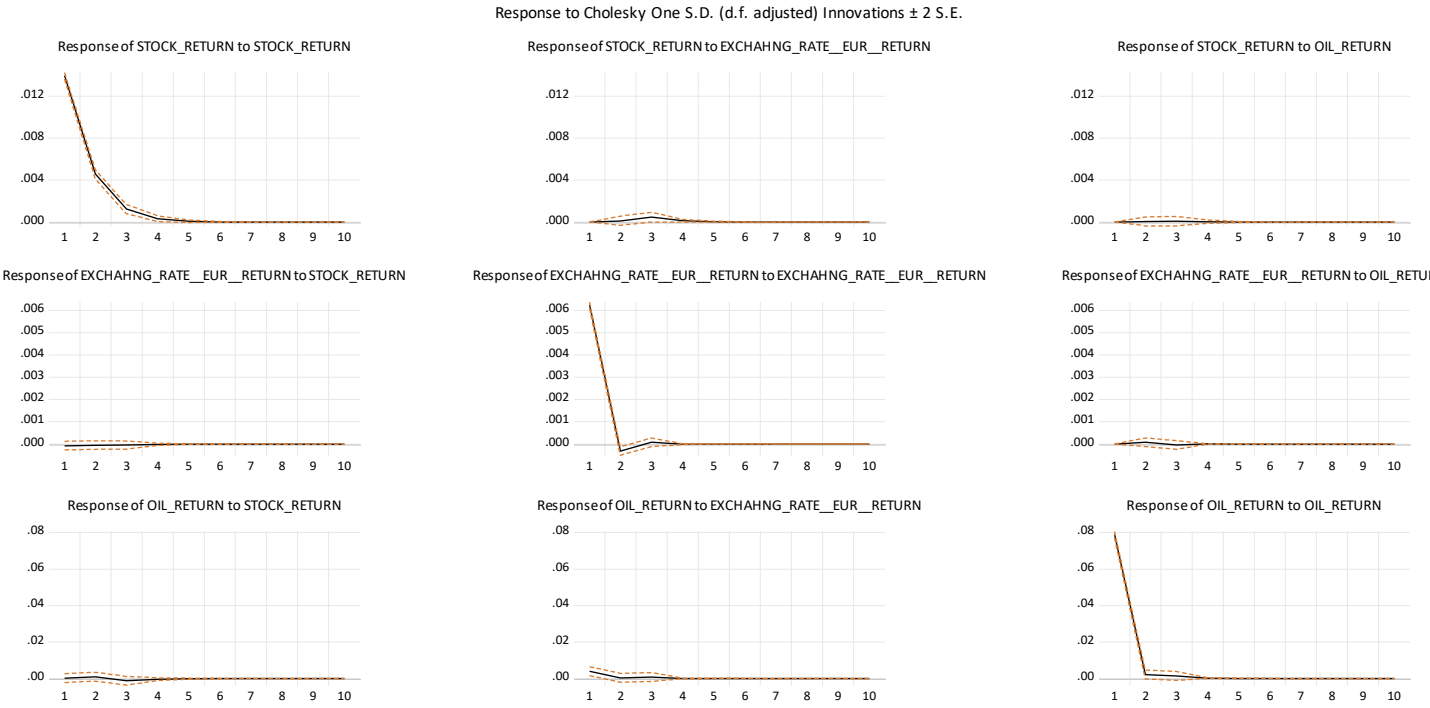

Figure1 13 Qatar Impulse Response

For Oman, the shock of index return is one standard deviation shock on index return (response of index return to index return). In addition, the shock of exchange return is one standard deviation shock on index return (response of index return to exchange return). Also, the shock of oil return is one standard deviation shock on index return (response of index return to oil return). Figure1 14 represents Oman's impulse response; the results suggest that Index return creates a steep decline effect. That can be interpreted as when a shock is introduced by Index return; the index returns

will decrease sharply. This reaction will become safe after four days. In addition, the results show that exchange return creates a transposed "U-shape". That can be interpreted as when a shock is introduced by exchange return; the index returns will increase on days two and three and then become stable. The results show that oil return creates a transposed "U-shape". That can be interpreted as when a shock is introduced by oil return, the index returns increase on the first day, decrease on the third day, and then become stable.

The results show that index return creates a transposed "line shape" from an exchange return perspective". That can be interpreted as when a shock is introduced by index return; the exchange returns will stay stable. The results suggest that exchange return creates a steep decline effect. That can be interpreted as when a shock is introduced by exchange return; the exchange returns will decrease sharply up to the second day and then becomes stable. This reaction will become safe after three days. The results show that oil return creates a transposed "line shape". That can be interpreted as when a shock is introduced by oil return; the exchange return will stay stable.

The results show that index return creates a transposed "U-shape" from an oil return perspective. That can be interpreted as when a shock is introduced by index return; the oil returns will increase on day two, decrease up to day four, then become stable. The results show that exchange return creates a transposed "U-shape". That can be interpreted as when a shock is introduced by exchange return; the oil return will decrease in the first day and then become stable. The results suggest that oil return creates a steep decline effect. That can be interpreted as when a shock is introduced by oil return; the oil returns will decrease sharply. This reaction will become safe after day four.

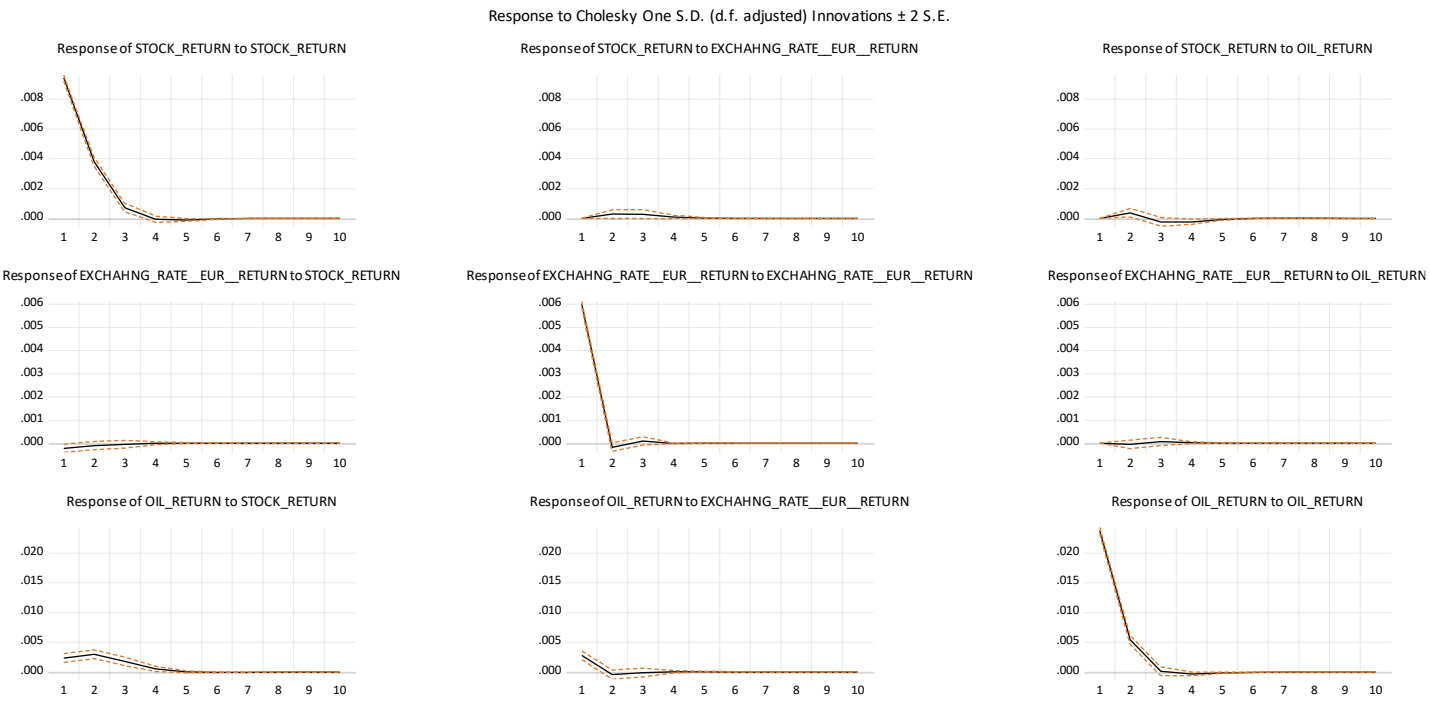

Figure1 14 Oman Impulse Response

For Bahrain, the shock of index return is one standard deviation shock on index return (response of index return to index return). In addition, the shock of exchange return is one standard deviation shock on index return (response of index return to exchange return). Also, the shock of oil return is one standard deviation shock on index return (response of index return to oil return). Figure1 14 represents Bahrain's impulse response; the results suggest that Index return creates a steep decline effect. That can be interpreted as when a shock is introduced by Index return; the index returns will decrease sharply. This reaction will become safe after four days. In addition, the results show that exchange returns create a transposed "line shape". That can be interpreted as when a shock is introduced by exchange return; the index returns will stay stable. The results show that oil return creates a transposed "line shape". That can be interpreted as when a shock is introduced by oil return; the index returns will stay stable.

The exchange return perspective shows that index return creates a transposed "line shape". That can be interpreted as when a shock is introduced by index return; the exchange returns will stay stable. The results suggest that exchange return creates a steep decline effect. That can be interpreted as when a shock is introduced by exchange return; the exchange returns will decrease sharply up to the second day, increase on day three, and then becomes stable. This reaction will become safe after three days. The results show that oil return creates a transposed "line shape".

That can be interpreted as when a shock is introduced by oil return; the exchange return will stay stable.

The results show that index return creates a transposed "U-shape" from an oil return perspective. That can be interpreted as when a shock is introduced by index return; the oil returns will decrease on day two, increase up to day four, and then become stable. The results show that exchange returns create a transposed "U-shape". That can be interpreted as when a shock is introduced by exchange return; the oil return will increase on the first day, decrease on day three, and become stable. The results suggest that oil return creates a steep decline effect. That can be interpreted as when a shock is introduced by oil return; the oil returns will decrease sharply. This reaction will become safe after day four.

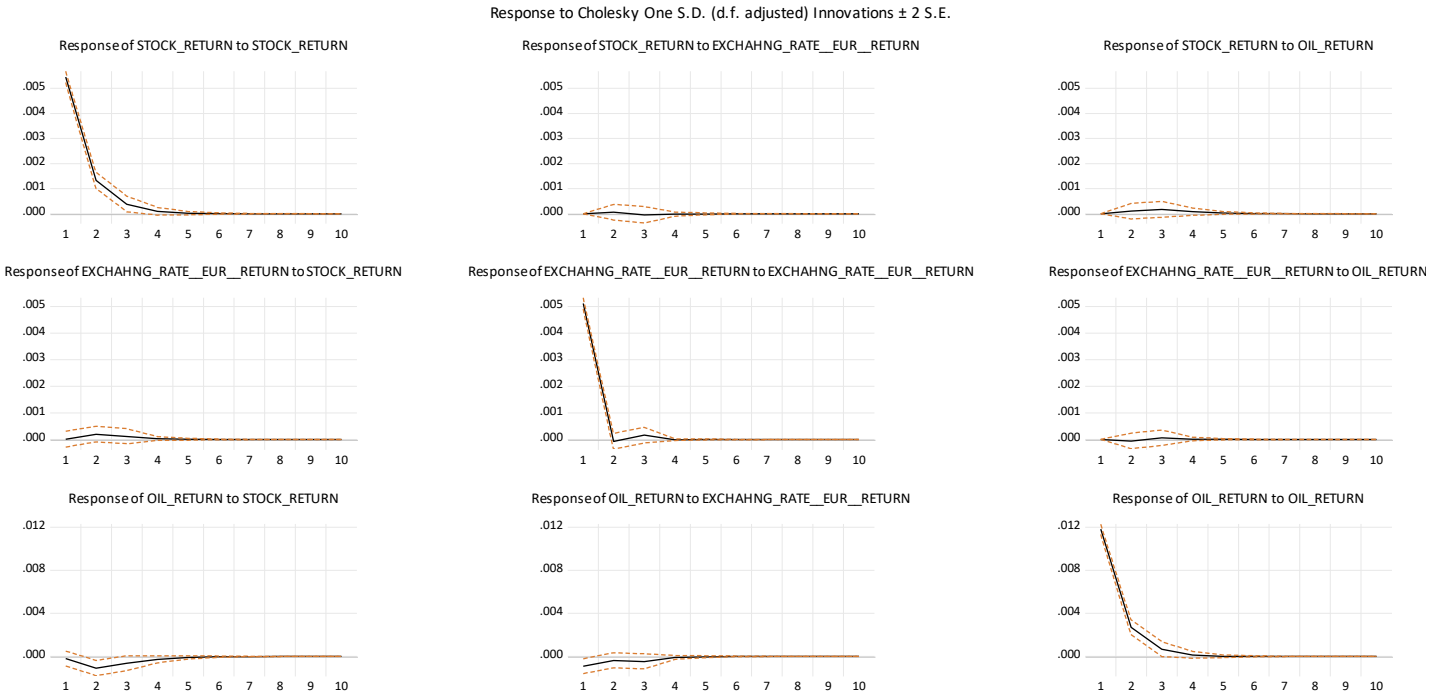

Figure1 15 Bahrain Impulse Response

Chapter Five- Conclusion

The present study investigates the Impact of COVID-19 on the GCC index, exchange rate, and oil return and compares these effects with the outcomes of structural changes to the GCC economy: corporate taxes and VAT implementation. Comparing COVID-19's Impact on the three variables with corporate tax and the VAT, an event study (constant return model) and standard vector auto-regression are shown. This was done by comparing exchange rates, oil prices, and daily index returns for COVID-19. This chapter presents the study's main findings, the research's limitations, and recommendations for future studies.

5.1 Main Findings and Conclusion

The following tables will represent the impact of all events; Corporate Tax, VAT, and COVID-19 in all GCC variables, Index return, exchange return, and Oil return of SA, UAE, Kuwait, Qatar, Oman, and Bahrain. Sign × represents that we accept the Null Hypothesis. In other words, the event has no impact on the return of a specific variable of a particular country. Sign ✓ represents that we reject the Null Hypothesis. In other words, the event impacts the return of a specific variable of a particular country.

Table 24 corporate tax findings

	Event	CT					
	Method	event study (short term)			VAR (long term)		
	Variables	IR	ER	OR	IR	ER	OR
country	SA	×	×	×	×	×	✓
	UAE	✓	×	✓	×	×	✓
	Kuwait	-	-	-	-	-	-
	Qatar	×	×	✓	×	×	×
	Oman	✓	×	×	×	×	×
	Bahrain	-	-	-	-	-	-

Corporate tax has a short-term impact on the index return of UAE and Oman, and it has a short-term effect on the oil return of UAE and Qatar. While in the long term, the Impact will just affect the oil return of SA and UAE.

Table 25 VAT findings

	Event	VAT					
	Method	event study (short term)			VAR (long term)		
	Variables	IR	ER	OR	IR	ER	OR
country	SA	✓	×	×	×	×	×
	UAE	×	×	×	×	×	×
	Kuwait	-	-	-	-	-	-
	Qatar	-	-	-	-	-	-
	Oman	✓	×	×	×	×	×
	Bahrain	×	×	✓	×	×	✓

VAT has a short-term impact on the index return of SA and Oman, and it has a short-term effect on the oil return of Bahrain. Although, in the long term, the Impact is just affecting Bahrain's oil return.

Table 26 COVID-19 findings

	Event	COVID-19					
	Method	event study (short term)			VAR (long term)		
	Variables	IR	ER	OR	IR	ER	OR
country	SA	✓	✓	×	×	×	×
	UAE	×	✓	×	×	×	×
	Kuwait	×	✓	×	×	×	×
	Qatar	×	✓	×	×	×	×
	Oman	×	✓	×	×	×	×
	Bahrain	×	×	×	×	×	×

COVID-19 has a short-term impact on the index return of SA, and it has a short-term effect on the exchange return of SA, UAE, Kuwait, Qatar, and Oman. Although, COVID-19 has no long-term impact on GCC Variables.

In addition, VAT and corporate tax have more Impact than COVID-19 on the long-term GCC oil return. Moreover, VAT, corporate tax, and COVID-19 have no impact on the long-term index return and exchange return. We can conclude from these results that the Impact of any new economic policy or pandemic will be more affected in the short term than long term or may not have any significant effect on the financial market. The market becomes more stable and is not affected significantly by new trends. This model uses VAR to determine the Impact of CT, VAT, and COVID-19 on index return, exchange return, and oil return and assess the impact of these

variables together (index return, exchange return, and oil return). Index returns for Saudi Arabia are influenced by oil returns, not by exchange returns.

Conversely, exchange return is not stationary nor significant with any Independent variables. Exchange returns influence oil returns. A negative relationship exists between the oil return and the exchange return. In the UAE, Index return is affected by the exchange rate and oil return. Despite this, exchange and oil returns are neither stationary nor significant when analyzed 65 65 with independent variables. In Kuwait, returns on the index and exchange are not stationary and insignificant with independent variables. However, oil return depends on exchange return. Qatar, exchange rates, and oil returns are not stationary or significant with any independent variables. Index returns in Oman are affected by the exchange rate. The return on exchange is not stationary and not significant with any independent variable. However, oil return is dependent on exchange return. Bahrain's index return and exchange return do not show statistical significance with independent variables. However, the oil return is dependent on the index return.

5.2 Limitations and Recommendations

Because of the time constraints and the lack of access to all required data, this study has many limitations. For Kuwait, there is no data available during a corporate tax event. Because of the limited sample size, the thesis did not include all countries - just GCC-specific fundamentals.

There are still many ways this study can be extended by including additional variables and/or adopting different methodologies such as; realized volatility, industrial indexes, and comparing with developed and non-developed markets, also by examining the differences between oil-dependent economies and non-oil-dependent economies. In addition, by modeling different time horizons with different annual, quarterly, or even daily frequencies. To further explain the models' outcomes, conduct interviews with subject matter experts and pay particular attention to economic recession periods and other key events that impacted the models.

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Appendix

Event Study (constant return model)

average		SA								
		CT			VAT			COVID-19		
		SR	ER	OR	SR	ER	OR	SR	ER	OR
		0.12%	-0.16%	0.75%	-0.18%	0.00%	0.32%	0.06%	0.03%	0.18%
Event Study		SA								
		VAT			VAT			COVID-19		
		SR	ER	OR	SR	ER	OR	SR	ER	OR
STDEV	STDEV	1.73%	0.95%	4.22%	0.70%	0.45%	0.92%	0.70%	0.45%	0.92%
	STDEV(30)	9.45%	5.20%	23.12%	3.83%	2.48%	5.02%	3.83%	2.48%	5.02%
	STDEV(61)	13.48%	7.41%	32.97%	5.47%	3.53%	7.15%	5.47%	3.53%	7.15%
return(CAR)	EVENT	0.45%	0.13%	-6.12%	-0.27%	0.42%	-0.63%	0.18%	0.16%	0.56%
	anticipation	-1.62%	-2.68%	13.37%	7.51%	3.75%	-1.53%	0.44%	-2.55%	2.08%
	adjustment	8.47%	-5.20%	-16.88%	9.44%	2.48%	-1.43%	-14.80%	-5.88%	0.27%
	TOTAL	7.30%	-7.75%	-9.64%	16.68%	6.64%	-3.58%	-14.19%	-8.27%	2.91%
return(BHAR)	EVENT	0.45%	0.13%	-6.12%	-0.27%	0.42%	-0.63%	-0.75%	0.06%	0.85%
	anticipation	-1.74%	-2.72%	10.80%	7.74%	3.80%	-1.57%	0.32%	-2.53%	1.73%
	adjustment	7.27%	-5.21%	-18.16%	9.83%	2.47%	-1.49%	-14.65%	-5.78%	-0.35%
	TOTAL	5.97%	-7.80%	-13.48%	17.31%	6.68%	-3.69%	-15.08%	-8.24%	2.23%
t- stat (CAR)	EVENT	25.87%	13.55%	-145.00%	-38.35%	91.80%	-68.78%	25.31%	34.98%	61.21%
	anticipation	-17.18%	-51.63%	57.81%	195.83%	151.26%	-30.42%	11.39%	-102.82%	41.43%
	adjustment	89.65%	-99.96%	-73.02%	246.23%	99.97%	-28.45%	-386.03%	-237.10%	5.46%
	TOTAL	54.13%	-104.57%	-29.23%	305.10%	187.94%	-50.09%	-259.5%	-233.90%	40.72%
t- stat (BHAR)	EVENT	25.87%	13.55%	-145.00%	-38.35%	91.80%	-68.78%	-107.36%	14.30%	93.27%
	anticipation	-18.41%	-52.41%	46.72%	201.93%	153.15%	-31.28%	8.42%	-101.91%	34.45%
	adjustment	76.90%	-100.18%	-78.54%	256.41%	99.55%	-29.64%	-382.06%	-233.15%	-6.93%
	TOTAL	44.33%	-105.27%	-40.88%	316.51%	188.97%	-51.53%	-275.78%	-233.14%	31.24%
P- value (CAR)	EVENT	79.69%	89.27%	15.34%	70.30%	36.31%	49.48%	80.12%	72.80%	54.33%
	anticipation	86.43%	60.80%	56.58%	5.59%	13.68%	76.23%	90.98%	30.89%	68.04%
	adjustment	37.44%	32.24%	46.87%	1.74%	32.24%	77.73%	0.03%	2.17%	95.67%
	TOTAL	59.07%	30.08%	77.13%	0.37%	6.61%	61.87%	1.24%	2.35%	68.56%
P- value (CAR)	EVENT	79.69%	89.27%	15.34%	70.30%	36.31%	49.48%	28.82%	88.69%	35.55%
	anticipation	85.47%	60.26%	64.24%	4.89%	13.21%	75.58%	93.33%	31.32%	73.19%
	adjustment	44.56%	32.14%	43.60%	1.35%	32.44%	76.82%	0.04%	2.39%	94.50%
	TOTAL	65.95%	29.76%	68.45%	0.27%	6.47%	60.87%	0.82%	2.39%	75.61%

average		UAE								
		CT			VAT			COVID-19		
		SR	ER	OR	SR	ER	OR	SR	ER	OR
		-0.401%	0.245%	-1.455%	-0.004%	-0.004%	0.322%	-0.025%	0.033%	0.081%
Event Study		UAE								
		VAT			VAT			COVID-19		
		SR	ER	OR	SR	ER	OR	SR	ER	OR
STDEV	STDEV	4.96%	6.21%	10.51%	0.58%	0.45%	0.91%	1.90%	0.43%	1.42%
	STDEV(30)	27.14%	34.03%	57.57%	3.15%	2.48%	5.01%	10.40%	2.37%	7.77%
	STDEV(61)	38.71%	48.53%	82.09%	4.49%	3.54%	7.14%	14.84%	3.38%	11.08%
return(CAR)	EVENT	1.97%	-0.82%	14.79%	0.188%	0.415%	-0.629%	-0.230%	0.157%	0.160%
	anticipation	-97.06%	19.10%	-18.66%	-1.85%	3.75%	-1.68%	2.26%	-2.64%	9.14%
	adjustment	7.42%	-11.51%	131.30%	3.77%	2.49%	-1.40%	-25.03%	-6.06%	0.19%
	TOTAL	-87.67%	6.77%	127.43%	2.11%	6.66%	-3.71%	-23.00%	-8.54%	9.48%
return(BHAR)	EVENT	1.97%	-0.82%	14.79%	0.19%	0.42%	-0.63%	-0.40%	0.06%	-0.65%
	anticipation	-64.24%	13.83%	-28.97%	-1.92%	3.80%	-1.72%	2.21%	-2.61%	9.25%
	adjustment	7.18%	-17.97%	205.50%	3.80%	2.48%	-1.46%	-23.59%	-5.96%	-0.37%
	TOTAL	-55.08%	-4.96%	191.33%	2.07%	6.69%	-3.81%	-21.77%	-8.51%	8.22%
t- stat (CAR)	EVENT	39.83%	-13.16%	140.71%	32.66%	91.75%	-68.76%	-12.13%	36.25%	11.24%
	anticipation	-357.57%	56.12%	-32.42%	-58.82%	151.34%	-33.51%	21.77%	-111.36%	117.59%
	adjustment	27.34%	-33.83%	228.07%	119.72%	100.29%	-27.94%	-240.59%	-255.74%	2.39%
	TOTAL	-226.49%	13.94%	155.22%	46.89%	188.21%	-51.90%	-155.01%	-252.80%	85.58%
t- stat (BHAR)	EVENT	39.83%	-13.16%	140.71%	32.66%	91.75%	-68.76%	-20.95%	14.51%	-46.11%
	anticipation	-236.64%	40.63%	-50.31%	-61.01%	153.23%	-34.32%	21.29%	-110.31%	119.06%
	adjustment	26.44%	-52.81%	356.96%	120.70%	99.88%	-29.14%	-226.74%	-251.27%	-4.82%
	TOTAL	-142.31%	-10.23%	233.07%	46.04%	189.25%	-53.31%	-146.76%	-251.72%	74.21%
P- value (CAR)	EVENT	69.22%	89.58%	16.57%	74.54%	36.34%	49.49%	90.39%	71.86%	91.10%
	anticipation	0.08%	57.72%	74.72%	55.91%	13.66%	73.90%	82.86%	27.09%	24.53%
	adjustment	78.57%	73.66%	2.70%	23.70%	32.08%	78.11%	2.00%	1.37%	98.10%
	TOTAL	2.80%	88.97%	12.70%	64.12%	6.58%	60.61%	12.76%	1.47%	39.63%
P- value (CAR)	EVENT	69.22%	89.58%	16.57%	74.54%	36.34%	49.49%	83.49%	88.52%	64.68%
	anticipation	2.20%	68.63%	61.71%	54.46%	13.19%	73.29%	83.23%	27.54%	23.96%
	adjustment	79.26%	59.98%	0.08%	23.32%	32.28%	77.20%	2.78%	1.53%	96.18%
	TOTAL	16.10%	91.90%	2.39%	64.73%	6.43%	59.64%	14.86%	1.52%	46.16%

average	Kuwait		
	COVID-19		
	SR	ER	OR
	-0.026%	0.023%	0.041%

Event Study		Kuwait		
		COVID-19		
		OR	SR	ER
STDEV	STDEV	2.03%	0.39%	1.42%
	STDEV(30)	11.12%	2.14%	7.79%
	STDEV(61)	15.86%	3.05%	11.11%
return(CAR)	EVENT	0.483%	0.126%	0.230%
	anticipation	13.48%	-2.25%	11.60%
	adjustment	-17.13%	-3.76%	3.47%
	TOTAL	-3.17%	-5.89%	15.29%
return(BHAR)	EVENT	0.57%	0.00%	-0.88%
	anticipation	14.15%	-2.24%	11.95%
	adjustment	-17.38%	-3.75%	2.93%
	TOTAL	-2.67%	-5.99%	14.00%
t- stat (CAR)	EVENT	23.78%	32.20%	16.13%
	anticipation	121.18%	-105.15%	148.82%
	adjustment	-153.99%	-175.57%	44.50%
	TOTAL	-19.97%	-192.75%	137.64%
t- stat (BHAR)	EVENT	28.26%	-0.28%	-61.64%
	anticipation	127.19%	-104.38%	153.35%
	adjustment	-156.33%	-175.01%	37.61%
	TOTAL	-16.81%	-195.96%	126.03%
P- value (CAR)	EVENT	81.30%	74.88%	87.25%
	anticipation	23.14%	29.82%	14.31%
	adjustment	13.00%	8.54%	65.83%
	TOTAL	84.26%	5.97%	17.50%
P- value (CAR)	EVENT	77.87%	99.78%	54.05%
	anticipation	20.94%	30.17%	13.16%

	adjustment	12.44%	8.64%	70.85%
	TOTAL	86.72%	5.57%	21.35%

average		Qatar					
		CT			COVID-19		
		SR	ER	OR	SR	ER	OR
		-0.056%	-0.034%	-0.463%	0.006%	0.040%	0.055%
Event Study		Qatar					
		CT			VAT		
		SR	ER	OR	SR	ER	OR
STDEV	STDEV	1.25%	0.40%	2.47%	1.44%	0.51%	1.46%
	STDEV(30)	6.87%	2.17%	13.56%	7.86%	2.78%	7.98%
	STDEV(61)	9.79%	3.09%	19.33%	11.21%	3.97%	11.38%
return(CAR)	EVENT	1.189%	0.441%	1.321%	0.006%	1.164%	0.688%
	anticipation	-3.40%	3.87%	2.34%	5.60%	-3.76%	7.18%
	adjustment	-6.49%	0.75%	41.04%	-13.99%	-5.45%	4.77%
	TOTAL	-8.70%	5.06%	44.70%	-8.38%	-8.04%	12.63%
return(BHAR)	EVENT	1.19%	0.44%	1.32%	-0.16%	0.54%	0.53%
	anticipation	-3.68%	3.91%	1.45%	5.57%	-3.71%	7.09%
	adjustment	-6.52%	0.73%	48.02%	-13.84%	-5.38%	4.26%
	TOTAL	-9.02%	5.09%	50.80%	-8.43%	-8.56%	11.87%
t- stat (CAR)	EVENT	94.83%	111.23%	53.37%	0.41%	228.90%	47.23%
	anticipation	-49.53%	178.29%	17.30%	71.21%	-135.05%	89.91%
	adjustment	-94.56%	34.67%	302.75%	-177.94%	-195.66%	59.77%
	TOTAL	-88.91%	163.59%	231.28%	-74.80%	-202.62%	111.01%
t- stat (BHAR)	EVENT	94.83%	111.23%	53.37%	-10.97%	105.25%	36.10%
	anticipation	-53.66%	180.32%	10.71%	70.87%	-133.43%	88.82%
	adjustment	-95.04%	33.73%	354.29%	-176.11%	-193.27%	53.34%
	TOTAL	-92.14%	164.35%	262.81%	-75.21%	-215.64%	104.31%

P- value (CAR)	EVENT	34.76%	27.14%	59.60%	99.68%	2.64%	63.88%
	anticipation	62.26%	8.08%	86.34%	47.98%	18.31%	37.30%
	adjustment	34.90%	73.03%	0.39%	8.14%	5.61%	55.28%
	TOTAL	37.83%	10.83%	2.50%	45.81%	4.82%	27.24%
P- value (CAR)	EVENT	34.76%	27.14%	59.60%	91.31%	29.77%	71.96%
	anticipation	59.40%	7.75%	91.51%	48.19%	18.83%	37.88%
	adjustment	34.66%	73.74%	0.09%	8.45%	5.91%	59.62%
	TOTAL	36.14%	10.67%	1.14%	45.56%	3.60%	30.20%

average		Oman								
		CT			VAT			COVID-19		
		SR	ER	OR	SR	ER	OR	SR	ER	OR
		0.076%	0.068%	0.137%	-0.060%	0.075%	-0.002%	-0.053%	0.032%	0.074%
Event Study		Oman								
		CT			VAT			COVID-19		
		SR	ER	OR	SR	ER	OR	SR	ER	OR
STDEV	STDEV	0.69%	0.71%	2.52%	0.50%	0.39%	1.05%	0.92%	0.43%	1.41%
	STDEV(30)	3.78%	3.91%	13.78%	2.73%	2.15%	5.76%	5.04%	2.37%	7.74%
	STDEV(61)	5.39%	5.57%	19.65%	3.90%	3.07%	8.21%	7.18%	3.39%	11.04%
return(CAR)	EVENT	-0.334%	0.242%	-0.964%	0.800%	0.323%	2.791%	-0.148%	0.157%	0.112%
	anticipation	1.58%	7.54%	35.43%	2.98%	-5.08%	-1.43%	8.62%	-2.70%	9.42%
	adjustment	11.18%	-1.17%	-2.07%	7.15%	0.08%	2.72%	-10.13%	-6.30%	0.07%
	TOTAL	12.43%	6.61%	32.39%	10.93%	-4.67%	4.07%	-1.66%	-8.85%	9.61%
return(BHAR)	EVENT	-0.33%	0.24%	-0.96%	0.80%	0.32%	2.79%	-0.06%	0.03%	-0.70%
	anticipation	1.58%	7.77%	40.93%	3.00%	-4.98%	-1.56%	8.82%	-2.67%	9.57%
	adjustment	11.59%	-1.27%	-3.49%	7.37%	0.06%	2.45%	-9.87%	-6.18%	-0.49%
	TOTAL	12.84%	6.75%	36.47%	11.17%	-4.59%	3.68%	-1.11%	-8.83%	8.38%
t- stat (CAR)	EVENT	-48.43%	33.94%	-38.33%	160.20%	82.17%	265.45%	-16.08%	36.16%	7.92%
	anticipation	41.83%	192.91%	257.12%	109.00%	-235.93%	-24.90%	171.16%	-113.76%	121.71%
	adjustment	295.97%	-29.83%	-15.06%	261.33%	3.89%	47.17%	-201.11%	-265.41%	0.92%
	TOTAL	230.69%	118.71%	164.85%	280.22%	-152.20%	49.60%	-23.07%	-261.28%	87.01%
t- stat (BHAR)	EVENT	-48.43%	33.94%	-38.33%	160.20%	82.17%	2.79%	-0.06%	0.03%	-0.70%
	anticipation	41.80%	198.95%	297.03%	109.79%	-231.24%	-27.11%	175.16%	-112.62%	123.57%
	adjustment	306.95%	-32.52%	-25.33%	269.37%	2.86%	42.63%	-195.97%	-260.38%	-6.33%
	TOTAL	238.38%	121.06%	185.63%	286.42%	-149.64%	44.87%	-15.49%	-260.74%	75.89%
P- value (CAR)	EVENT	63.03%	73.58%	70.31%	11.56%	41.52%	1.07%	87.29%	71.92%	93.72%
	anticipation	67.76%	5.95%	1.32%	28.10%	2.23%	80.44%	9.33%	26.08%	22.94%

	adjustment	0.47%	76.68%	88.09%	1.19%	96.91%	63.93%	4.98%	1.07%	99.27%
	TOTAL	2.53%	24.09%	10.56%	0.72%	13.44%	62.21%	81.85%	1.19%	38.85%
P- value (CAR)	EVENT	63.03%	73.58%	70.31%	11.56%	41.52%	97.78%	99.95%	99.98%	99.45%
	anticipation	67.78%	5.22%	0.46%	27.76%	2.50%	78.75%	8.61%	26.56%	22.24%
	adjustment	0.35%	74.64%	80.11%	0.96%	97.73%	67.18%	5.57%	1.22%	94.98%
	TOTAL	2.11%	23.19%	6.94%	0.61%	14.10%	65.56%	87.75%	1.21%	45.15%

average		Bahrain					
		VAT			COVID-19		
		SR	ER	OR	SR	ER	OR
		0.115%	-0.010%	0.138%	0.053%	-0.014%	-0.039%
Event Study		Bahrain					
		VAT			VAT		
		SR	ER	OR	SR	ER	OR
STDEV	STDEV	0.40%	0.33%	1.35%	0.70%	0.47%	1.28%
	STDEV(30)	2.20%	1.82%	7.37%	3.82%	2.56%	7.00%
	STDEV(61)	3.13%	2.60%	10.51%	5.44%	3.65%	9.99%
return(CAR)	EVENT	0.179%	0.105%	3.901%	-0.139%	0.207%	0.782%
	anticipation	-2.65%	-2.71%	5.65%	9.10%	-0.40%	1.41%
	adjustment	1.82%	-0.27%	16.07%	-7.05%	-3.72%	19.73%
	TOTAL	-0.65%	-2.88%	25.62%	1.91%	-3.91%	21.92%
return(BHAR)	EVENT	0.18%	0.10%	3.90%	0.02%	0.03%	0.21%
	anticipation	-2.64%	-2.68%	5.70%	9.48%	-0.40%	1.32%
	adjustment	1.82%	-0.28%	16.58%	-6.97%	-3.74%	21.09%
	TOTAL	-0.65%	-2.86%	26.18%	2.52%	-4.12%	22.62%
t- stat (CAR)	EVENT	44.55%	31.44%	289.78%	-20.00%	44.23%	61.19%
	anticipation	-120.51%	-148.93%	76.60%	238.47%	-15.50%	20.09%
	adjustment	82.76%	-14.90%	217.89%	-184.87%	-145.13%	
	TOTAL	-20.77%	-110.87%	243.63%	33.60%	-116.41%	81.28%
t- stat (BHAR)	EVENT	0.18%	0.10%	3.90%	0.02%	0.03%	0.21%

	anticipation	-120.36%	-147.35%	77.23%	248.42%	-15.69%	18.87%
	adjustment	82.76%	-15.52%	224.85%	-182.73%	-146.08%	301.17%
	TOTAL	-20.66%	-110.19%	248.95%	46.37%	-112.66%	226.56%
P- value (CAR)	EVENT	65.79%	75.45%	0.56%	84.23%	66.02%	54.34%
	anticipation	23.40%	14.28%	44.74%	2.10%	87.74%	84.16%
	adjustment	41.19%	88.21%	3.42%	7.05%	15.31%	100.00%
	TOTAL	83.64%	27.30%	1.85%	73.83%	25.00%	42.03%
P- value (CAR)	EVENT	99.86%	99.92%	96.90%	99.99%	99.98%	99.83%
	anticipation	23.45%	14.70%	44.36%	1.65%	87.59%	85.11%
	adjustment	41.19%	87.73%	2.91%	7.37%	15.05%	0.41%
	TOTAL	83.71%	27.59%	1.62%	64.49%	26.54%	2.79%

Vector Auto-regression Model

Saudi Arabia: Vector Auto regression Estimates
Date: 04/06/22 Time: 21:12
Sample (adjusted): 10/23/1998 2/10/2022
Included observations: 5259 after adjustments
Standard errors in ( ) & t-statistics in [ ]

	STOCK_RETURN	EXCHAHNG_RATE__EUR__RETURN	OIL_RETURN	DUMMY_CT	DUMMY_ VATID	DUMMY_COV
STOCK_RETURN(-1)	0.398888	0.002434	0.001968	-0.006832	0.001209	0.000693
	(0.01376)	(0.00582)	(0.02518)	(0.01110)	(0.01112)	(0.01111)
	[28.9916]	[0.41805]	[0.07816]	[-0.61565]	[0.10879]	[0.06236]
STOCK_RETURN(-2)	0.087359	-0.005339	-0.010718	0.012340	0.000629	-0.002885
	(0.01374)	(0.00582)	(0.02515)	(0.01108)	(0.01110)	(0.01109)
	[6.35697]	[-0.91800]	[-0.42614]	[1.11332]	[0.05663]	[-0.26010]
EXCHAHNG_RATE__EUR__RETURN(-1)	0.035498	0.126892	-0.166826	0.017638	0.014249	0.003101
	(0.03260)	(0.01380)	(0.05967)	(0.02630)	(0.02634)	(0.02632)
	[1.08876]	[9.19668]	[-2.79578]	[0.67071]	[0.54087]	[0.11785]
EXCHAHNG_RATE__EUR__RETURN(-2)	-0.048851	-0.087035	-0.056271	-0.006161	0.014520	0.003383
	(0.03263)	(0.01381)	(0.05971)	(0.02632)	(0.02636)	(0.02633)
	[-1.49731]	[-6.30362]	[-0.94237]	[-0.23414]	[0.55080]	[0.12845]
OIL_RETURN(-1)	0.021920	-0.003321	0.272945	-0.006768	0.000389	0.000396

	(0.00755)	(0.00320)	(0.01382)	(0.00609)	(0.00610)	(0.00610)
	[2.90266]	[-1.03929]	[19.7485]	[-1.11107]	[0.06380]	[0.06498]
OIL_RETURN(-2)	-0.002696	0.003753	-0.066923	-0.001591	7.92E-05	-0.000496
	(0.00755)	(0.00320)	(0.01382)	(0.00609)	(0.00610)	(0.00610)
	[-0.35702]	[1.17428]	[-4.84219]	[-0.26122]	[0.01298]	[-0.08140]
DUMMY_CT(-1)	0.009834	-0.002549	-0.065141	0.996345	-4.85E-05	-2.71E-05
	(0.01712)	(0.00724)	(0.03133)	(0.01381)	(0.01383)	(0.01382)
	[0.57445]	[-0.35185]	[-2.07908]	[72.1566]	[-0.00350]	[-0.00196]
DUMMY_CT(-2)	-0.009735	0.003616	0.062722	0.000321	0.000262	2.01E-05
	(0.01709)	(0.00723)	(0.03128)	(0.01379)	(0.01381)	(0.01380)
	[-0.56957]	[0.49984]	[2.00505]	[0.02327]	[0.01899]	[0.00146]
DUMMY_ VAT (-1)	-0.002134	-0.003839	0.008243	-0.000143	0.999640	-1.20E-05
	(0.01709)	(0.00723)	(0.03127)	(0.01378)	(0.01381)	(0.01379)
	[-0.12489]	[-0.53083]	[0.26359]	[-0.01039]	[72.4023]	[-0.00087]
DUMMY_ VAT (-2)	0.002445	0.003497	-0.007281	0.000155	0.000125	0.002522
	(0.01711)	(0.00724)	(0.03131)	(0.01380)	(0.01382)	(0.01381)
	[0.14292]	[0.48298]	[-0.23255]	[0.01124]	[0.00902]	[0.18267]
DUMMY_COVID(-1)	0.008718	-0.000153	-0.005000	-3.75E-05	-1.17E-05	0.997492
	(0.01711)	(0.00724)	(0.03131)	(0.01380)	(0.01382)	(0.01381)
	[0.50964]	[-0.02114]	[-0.15971]	[-0.00272]	[-0.00085]	[72.2459]
DUMMY_COVID(-2)	-0.008904	0.000375	0.003810	2.38E-05	6.39E-06	-7.97E-07
	(0.01710)	(0.00724)	(0.03130)	(0.01380)	(0.01382)	(0.01380)
	[-0.52060]	[0.05186]	[0.12173]	[0.00173]	[0.00046]	[-5.8e-05]
C	0.000496	-0.000982	0.003662	0.003339	2.51E-05	9.29E-06
	(0.00098)	(0.00042)	(0.00180)	(0.00079)	(0.00079)	(0.00079)
	[0.50492]	[-2.36298]	[2.03733]	[4.21448]	[0.03159]	[0.01171]
R-squared	0.200080	0.022466	0.071880	0.996512	0.998609	0.997619
Adj. R-squared	0.198250	0.020230	0.069757	0.996504	0.998606	0.997614
Sum sq. resids	1.531121	0.274213	5.128631	0.996094	0.999620	0.997472
S.E. equation	0.017084	0.007230	0.031267	0.013780	0.013804	0.013789
F-statistic	109.3460	10.04703	33.85698	124882.0	313870.4	183173.2
Log likelihood	13946.39	18468.74	10767.75	15076.85	15067.56	15073.22
Akaike AIC	-5.298875	-7.018726	-4.090036	-5.728789	-5.725255	-5.727407
Schwarz SC	-5.282640	-7.002491	-4.073801	-5.712554	-5.709020	-5.711172
Mean dependent	0.001284	-1.87E-05	0.001784	0.942384	0.163339	0.087279
S.D. dependent	0.019080	0.007304	0.032418	0.233037	0.369710	0.282270

Determinant resid covariance (dof adj.)	1.02E-22
Determinant resid covariance	1.00E-22
Log likelihood	88422.23
Akaike information criterion	-33.59735
Schwarz criterion	-33.49994
Number of coefficients	78

United Arab Emirates Vector Auto regression Estimates
Date: 04/06/22 Time: 21:13
Sample (adjusted): 8/31/2005 2/10/2022
Included observations: 3716 after adjustments
Standard errors in ( ) & t-statistics in [ ]

	SR_UAE_ADXG	EXCHAHNG_RATE__EUR__RETURN	OIL_RETURN	DUMMY_CT	DUMMY_ VAT	DUMMY_COVID
SR_UAE_ADXG(-1)	0.867654	-0.005091	0.006909	0.000367	-4.64E-05	-3.94E-05
	(0.01628)	(0.00587)	(0.00376)	(0.00223)	(0.00226)	(0.00225)
	[53.2950]	[-0.86732]	[1.83654]	[0.16435]	[-0.02056]	[-0.01746]
SR_UAE_ADXG(-2)	-0.090294	0.002723	-0.008886	-0.000743	0.000116	1.81E-05
	(0.01628)	(0.00587)	(0.00376)	(0.00223)	(0.00226)	(0.00225)
	[-5.54664]	[0.46386]	[-2.36242]	[-0.33286]	[0.05128]	[0.00804]
EXCHAHNG_RATE__EUR__RETURN(-1)	-0.097422	0.451428	-0.019114	-0.000229	0.000378	6.13E-05
	(0.04332)	(0.01562)	(0.01001)	(0.00594)	(0.00600)	(0.00600)
	[-2.24912]	[28.9046]	[-1.90974]	[-0.03848]	[0.06294]	[0.01021]
EXCHAHNG_RATE__EUR__RETURN(-2)	0.158330	-0.310605	0.019946	-2.39E-05	0.000359	9.39E-05
	(0.04332)	(0.01562)	(0.01001)	(0.00594)	(0.00600)	(0.00600)
	[3.65469]	[-19.8846]	[1.99259]	[-0.00402]	[0.05984]	[0.01565]
OIL_RETURN(-1)	0.199660	-0.047811	0.431003	0.027198	0.000482	0.000330
	(0.07041)	(0.02539)	(0.01627)	(0.00966)	(0.00976)	(0.00975)
	[2.83551]	[-1.88317]	[26.4903]	[2.81533]	[0.04937]	[0.03383]
OIL_RETURN(-2)	-0.370201	0.030432	-0.070750	-0.082272	0.000671	-0.001595
	(0.07016)	(0.02530)	(0.01621)	(0.00963)	(0.00972)	(0.00971)
	[-5.27688]	[1.20309]	[-4.36451]	[-8.54775]	[0.06903]	[-0.16418]
DUMMY_CT(-1)	-0.044126	0.010722	0.232804	0.993158	-4.50E-05	-8.24E-05
	(0.11905)	(0.04293)	(0.02751)	(0.01633)	(0.01650)	(0.01648)
	[-0.37064]	[0.24978]	[8.46297]	[60.8054]	[-0.00273]	[-0.00500]
DUMMY_CT(-2)	0.037129	-0.011294	-0.231558	0.005754	0.000542	8.48E-05
	(0.11900)	(0.04291)	(0.02750)	(0.01633)	(0.01649)	(0.01648)
	[0.31200]	[-0.26321]	[-8.42113]	[0.35246]	[0.03286]	[0.00514]
DUMMY_ VAT (-1)	-0.002623	-0.004816	0.008364	0.000318	0.999500	4.60E-06
	(0.11856)	(0.04275)	(0.02740)	(0.01627)	(0.01643)	(0.01642)
	[-0.02212]	[-0.11266]	[0.30529]	[0.01957]	[60.8216]	[0.00028]
DUMMY_ VAT (-2)	0.002948	0.004216	-0.007697	-0.000276	2.70E-06	0.002442
	(0.11868)	(0.04279)	(0.02742)	(0.01628)	(0.01645)	(0.01643)
	[0.02484]	[0.09853]	[-0.28069]	[-0.01694]	[0.00016]	[0.14857]
DUMMY_COVID(-1)	-0.001528	-0.000673	0.008948	0.000195	5.48E-06	0.997556
	(0.11868)	(0.04279)	(0.02742)	(0.01628)	(0.01645)	(0.01643)
	[-0.01287]	[-0.01572]	[0.32629]	[0.01197]	[0.00033]	[60.7029]
DUMMY_COVID(-2)	0.001233	0.000843	-0.009316	-0.000229	-4.87E-06	-2.24E-06
	(0.11866)	(0.04278)	(0.02742)	(0.01628)	(0.01645)	(0.01643)
	[0.01039]	[0.01969]	[-0.33976]	[-0.01407]	[-0.00030]	[-0.00014]
C	0.007264	0.001014	-0.000731	0.001150	-1.60E-06	-1.06E-06
	(0.00413)	(0.00149)	(0.00095)	(0.00057)	(0.00057)	(0.00057)
	[1.75853]	[0.68063]	[-0.76602]	[2.02857]	[-0.00279]	[-0.00186]
R-squared	0.641103	0.204351	0.192324	0.998480	0.998505	0.997543
Adj. R-squared	0.639940	0.201772	0.189707	0.998475	0.998500	0.997535
Sum sq. resids	52.02668	6.763618	2.777741	0.979287	0.999496	0.997547
S.E. equation	0.118532	0.042738	0.027389	0.016262	0.016429	0.016413

F-statistic	551.2274	79.25497	73.48005	202640.9	206063.7	125303.6
Log likelihood	2658.369	6449.059	8102.530	10039.62	10001.67	10005.30
Akaike AIC	-1.423773	-3.463971	-4.353891	-5.396459	-5.376034	-5.377985
Schwarz SC	-1.402011	-3.442210	-4.332130	-5.374698	-5.354272	-5.356224
Mean dependent	0.007948	0.000493	0.000626	0.776911	0.235199	0.124865
S.D. dependent	0.197537	0.047835	0.030426	0.416374	0.424180	0.330611

Determinant resid covariance (dof adj.)	3.67E-19
Determinant resid covariance	3.60E-19
Log likelihood	47270.67
Akaike information criterion	-25.39972
Schwarz criterion	-25.26915
Number of coefficients	78

Kuwait: Vector Auto regression Estimates
Date: 04/06/22 Time: 21:15
Sample (adjusted): 1/04/2013 2/10/2022
Included observations: 1904 after adjustments
Standard errors in ( ) & t-statistics in [ ]

	STOCK_RETURN	EXCHAHNG_RATE__EUR__RETURN	OIL_RETURN	DUMMY_COVID
STOCK_RETURN(-1)	0.332312	0.009320	-0.094121	0.023214
	(0.02305)	(0.00986)	(0.03193)	(0.04962)
	[14.4190]	[0.94527]	[-2.94733]	[0.46782]
STOCK_RETURN(-2)	0.006722	0.012391	0.049680	0.028770
	(0.02302)	(0.00985)	(0.03189)	(0.04956)
	[0.29206]	[1.25839]	[1.55773]	[0.58053]
EXCHAHNG_RATE__EUR__RETURN(-1)	0.018595	-0.039111	-0.164879	0.010712
	(0.05368)	(0.02297)	(0.07438)	(0.11558)
	[0.34639]	[-1.70296]	[-2.21660]	[0.09268]
EXCHAHNG_RATE__EUR__RETURN(-2)	0.000987	-0.010705	-0.128057	0.018890
	(0.05372)	(0.02298)	(0.07444)	(0.11567)
	[0.01837]	[-0.46580]	[-1.72035]	[0.16331]
OIL_RETURN(-1)	0.031627	-0.011912	0.398894	0.004743
	(0.01658)	(0.00709)	(0.02298)	(0.03570)
	[1.90729]	[-1.67911]	[17.3607]	[0.13284]
OIL_RETURN(-2)	0.005669	0.006824	-0.031204	-0.010755
	(0.01656)	(0.00708)	(0.02294)	(0.03565)
	[0.34236]	[0.96338]	[-1.36009]	[-0.30168]
DUMMY_COVID(-1)	-0.006332	-0.000784	0.009178	0.999041
	(0.01067)	(0.00456)	(0.01478)	(0.02297)
	[-0.59349]	[-0.17173]	[0.62086]	[43.4900]
DUMMY_COVID(-2)	0.006386	0.000843	-0.008387	0.000264
	(0.01068)	(0.00457)	(0.01479)	(0.02299)
	[0.59813]	[0.18449]	[-0.56689]	[0.01147]
C	0.000240	-7.52E-05	0.000327	0.000679
	(0.00028)	(0.00012)	(0.00039)	(0.00060)

	[0.85521]	[-0.62635]	[0.83976]	[1.12269]
R-squared	0.117170	0.005025	0.157384	0.997133
Adj. R-squared	0.113443	0.000825	0.153826	0.997121
Sum sq. resids	0.215451	0.039434	0.413655	0.998804
S.E. equation	0.010663	0.004562	0.014775	0.022958
F-statistic	31.43821	1.196310	44.24343	82376.90
Log likelihood	5948.911	7565.520	5327.922	4488.710
Akaike AIC	-6.239403	-7.937521	-5.587103	-4.705578
Schwarz SC	-6.213160	-7.911279	-5.560861	-4.679336
Mean dependent	0.000417	-5.41E-05	0.000823	0.241071
S.D. dependent	0.011324	0.004564	0.016061	0.427846

Determinant resid covariance (dof adj.)	2.70E-16
Determinant resid covariance	2.65E-16
Log likelihood	23338.15
Akaike information criterion	-24.47704
Schwarz criterion	-24.37207
Number of coefficients	36

Qatar: Vector Auto regression Estimates
Date: 04/06/22 Time: 21:17
Sample (adjusted): 1/08/2002 2/10/2022
Included observations: 4195 after adjustments
Standard errors in ( ) & t-statistics in [ ]

	STOCK_RETURN	EXCHAHNG_RATE__EUR__RETURN	OIL_RETURN	DUMMY_CT	DUMMY_COVID
STOCK_RETURN(-1)	0.327734	-0.004300	0.063180	0.012757	-0.002515
	(0.01545)	(0.00691)	(0.08766)	(0.01711)	(0.01712)
	[21.2114]	[-0.62206]	[0.72074]	[0.74556]	[-0.14692]
STOCK_RETURN(-2)	-0.018362	-0.002492	-0.115644	0.007641	-0.001783
	(0.01545)	(0.00691)	(0.08767)	(0.01711)	(0.01712)
	[-1.18821]	[-0.36038]	[-1.31906]	[0.44649]	[-0.10416]
EXCHAHNG_RATE__EUR__RETURN(-1)	0.018478	-0.052425	0.035880	0.011698	0.001349
	(0.03459)	(0.01548)	(0.19623)	(0.03830)	(0.03832)
	[0.53423]	[-3.38760]	[0.18285]	[0.30541]	[0.03521]
EXCHAHNG_RATE__EUR__RETURN(-2)	0.069228	0.009741	0.099315	0.009803	0.008546
	(0.03458)	(0.01547)	(0.19620)	(0.03830)	(0.03831)
	[2.00183]	[0.62954]	[0.50619]	[0.25598]	[0.22306]
OIL_RETURN(-1)	0.000838	0.000958	0.027206	1.53E-05	8.09E-05
	(0.00273)	(0.00122)	(0.01547)	(0.00302)	(0.00302)
	[0.30732]	[0.78537]	[1.75845]	[0.00508]	[0.02677]
OIL_RETURN(-2)	0.000685	-0.000557	0.016190	-0.000595	-0.000252
	(0.00273)	(0.00122)	(0.01547)	(0.00302)	(0.00302)
	[0.25101]	[-0.45679]	[1.04640]	[-0.19697]	[-0.08346]
DUMMY_CT(-1)	0.003165	0.005815	0.013108	0.998745	3.01E-05
	(0.01396)	(0.00625)	(0.07921)	(0.01546)	(0.01547)
	[0.22671]	[0.93099]	[0.16550]	[64.6007]	[0.00195]

DUMMY_CT(-2)	-0.003644	-0.006224	-0.015113	0.000315	0.000341
	(0.01396)	(0.00624)	(0.07918)	(0.01546)	(0.01546)
	[-0.26109]	[-0.99673]	[-0.19086]	[0.02036]	[0.02205]
DUMMY_COVID(-1)	0.000309	-0.000433	0.006984	3.60E-05	0.999620
	(0.01395)	(0.00624)	(0.07917)	(0.01545)	(0.01546)
	[0.02213]	[-0.06935]	[0.08821]	[0.00233]	[64.6596]
DUMMY_COVID(-2)	-0.000406	0.000515	-0.004962	-3.39E-05	8.62E-06
	(0.01397)	(0.00625)	(0.07924)	(0.01547)	(0.01547)
	[-0.02904]	[0.08239]	[-0.06262]	[-0.00219]	[0.00056]
C	0.000825	0.000411	0.001319	0.000930	1.83E-06
	(0.00043)	(0.00019)	(0.00246)	(0.00048)	(0.00048)
	[1.90144]	[2.11972]	[0.53605]	[1.93589]	[0.00381]
R-squared	0.105319	0.004085	0.001730	0.998721	0.997559
Adj. R-squared	0.103181	0.001704	-0.000656	0.998718	0.997553
Sum sq. resids	0.814399	0.163041	26.21359	0.998739	0.999604
S.E. equation	0.013952	0.006242	0.079153	0.015450	0.015457
F-statistic	49.25291	1.716004	0.725184	326831.5	171009.0
Log likelihood	11974.79	15348.50	4693.143	11546.81	11544.99
Akaike AIC	-5.703832	-7.312279	-2.232249	-5.499789	-5.498923
Schwarz SC	-5.687203	-7.295650	-2.215620	-5.483160	-5.482294
Mean dependent	0.000672	0.000105	1.66E-05	0.752563	0.109654
S.D. dependent	0.014732	0.006248	0.079127	0.431574	0.312496

Determinant resid covariance (dof adj.)	2.70E-18
Determinant resid covariance	2.67E-18
Log likelihood	55113.88
Akaike information criterion	-26.24977
Schwarz criterion	-26.16662
Number of coefficients	55

Oman: Vector Auto regression Estimates
Date: 04/06/22 Time: 21:20
Sample (adjusted): 12/27/2000 2/10/2022
Included observations: 4406 after adjustments
Standard errors in ( ) & t-statistics in [ ]

	STOCK_RETURN	EXCHAHNG_RATE__EUR__RETURN	OIL_RETURN	DUMMY_CT	DUMMY_VATID	DUMMY_COV
STOCK_RETURN(-1)	0.401245	-0.011256	0.256516	-0.002908	0.002697	-0.029537
	(0.01509)	(0.00961)	(0.03854)	(0.02410)	(0.02410)	(0.02414)
	[26.5872]	[-1.17133]	[6.65585]	[-0.12066]	[0.11187]	[-1.22362]
STOCK_RETURN(-2)	-0.084637	-0.000157	0.023185	-0.007800	-0.011313	-0.011516
	(0.01518)	(0.00966)	(0.03876)	(0.02424)	(0.02424)	(0.02428)
	[-5.57672]	[-0.01624]	[0.59821]	[-0.32183]	[-0.46672]	[-0.47439]
EXCHAHNG_RATE__EUR__RETURN(-1)	0.041169	-0.028587	-0.180137	0.030062	0.007222	0.000884
	(0.02387)	(0.01520)	(0.06095)	(0.03811)	(0.03812)	(0.03817)
	[1.72501]	[-1.88120]	[-2.95563]	[0.78878]	[0.18947]	[0.02316]
EXCHAHNG_RATE__EUR__RETURN(-2)	0.039381	0.012987	0.005910	-0.025540	-0.026009	0.007721
	(0.02388)	(0.01521)	(0.06099)	(0.03814)	(0.03814)	(0.03820)

	[1.64906]	[0.85408]	[0.09691]	[-0.66969]	[-0.68188]	[0.20213]
OIL_RETURN(-1)	0.015628	-0.002160	0.228141	-0.003515	0.000759	0.002704
	(0.00597)	(0.00380)	(0.01524)	(0.00953)	(0.00953)	(0.00955)
	[2.61801]	[-0.56843]	[14.9661]	[-0.36879]	[0.07959]	[0.28324]
OIL_RETURN(-2)	-0.020093	0.003699	-0.051629	0.030406	-0.002022	-0.000727
	(0.00594)	(0.00378)	(0.01517)	(0.00949)	(0.00949)	(0.00950)
	[-3.38137]	[0.97780]	[-3.40231]	[3.20423]	[-0.21306]	[-0.07647]
DUMMY_CT(-1)	-0.003141	-0.004490	-0.026316	0.998073	0.000120	-9.34E-05
	(0.00944)	(0.00601)	(0.02410)	(0.01507)	(0.01507)	(0.01510)
	[-0.33288]	[-0.74726]	[-1.09195]	[66.2262]	[0.00799]	[-0.00619]
DUMMY_CT(-2)	0.003412	0.004015	0.025452	0.000354	-0.000128	0.000415
	(0.00943)	(0.00601)	(0.02409)	(0.01506)	(0.01506)	(0.01509)
	[0.36176]	[0.66855]	[1.05677]	[0.02348]	[-0.00847]	[0.02749]
DUMMY_ VAT (-1)	-0.015144	-0.001521	-0.009615	8.78E-06	0.996347	0.000119
	(0.00945)	(0.00602)	(0.02413)	(0.01509)	(0.01509)	(0.01511)
	[-1.60290]	[-0.25287]	[-0.39851]	[0.00058]	[66.0283]	[0.00789]
DUMMY_ VAT (-2)	0.015285	0.001280	0.009206	-2.92E-06	4.12E-05	-0.000108
	(0.00946)	(0.00602)	(0.02415)	(0.01510)	(0.01510)	(0.01513)
	[1.61624]	[0.21264]	[0.38118]	[-0.00019]	[0.00273]	[-0.00715]
DUMMY_COVID(-1)	-0.006017	-0.000754	0.007339	-0.000143	-0.000145	0.999539
	(0.00943)	(0.00601)	(0.02409)	(0.01506)	(0.01507)	(0.01509)
	[-0.63792]	[-0.12553]	[0.30467]	[-0.00948]	[-0.00961]	[66.2484]
DUMMY_COVID(-2)	0.005853	0.000723	-0.006811	0.000128	0.003752	0.000147
	(0.00945)	(0.00602)	(0.02413)	(0.01509)	(0.01509)	(0.01511)
	[0.61951]	[0.12017]	[-0.28229]	[0.00850]	[0.24863]	[0.00970]
C	2.50E-05	0.000494	0.001532	0.001552	1.23E-05	-4.85E-06
	(0.00038)	(0.00024)	(0.00097)	(0.00060)	(0.00060)	(0.00060)
	[0.06614]	[2.05410]	[1.58738]	[2.57185]	[0.02034]	[-0.00802]
R-squared	0.148909	0.002697	0.068345	0.998138	0.994260	0.997570
Adj. R-squared	0.146584	-0.000028	0.065800	0.998133	0.994245	0.997563
Sum sq. resids	0.390515	0.158320	2.546740	0.995894	0.996204	0.999123
S.E. equation	0.009428	0.006003	0.024078	0.015057	0.015059	0.015081
F-statistic	64.05093	0.989882	26.85520	196262.5	63415.10	150293.4
Log likelihood	14304.38	16293.35	10173.52	12241.98	12241.30	12234.85
Akaike AIC	-6.487234	-7.390084	-4.612130	-5.551059	-5.550748	-5.547822
Schwarz SC	-6.468378	-7.371228	-4.593274	-5.532203	-5.531892	-5.528966
Mean dependent	0.000353	6.85E-05	0.001105	0.858602	0.041080	0.104176
S.D. dependent	0.010206	0.006003	0.024911	0.348471	0.198499	0.305524

Determinant resid covariance (dof adj.)	2.12E-23
Determinant resid covariance	2.08E-23
Log likelihood	77544.88
Akaike information criterion	-35.16427
Schwarz criterion	-35.05113
Number of coefficients	78

Bahrain: Vector Auto regression Estimates
Date: 04/06/22 Time: 21:21
Sample (adjusted): 6/03/2014 2/10/2022
Included observations: 1206 after adjustments

Standard errors in ( ) & t-statistics in [ ]

	STOCK_RETURN	EXCHAHNG_RATE__EUR__RETURN	OIL_RETURN	DUMMY_VATID	DUMMY_COVID
STOCK_RETURN(-1)	0.241847	0.037200	-0.198673	0.059715	0.133800
	(0.02893)	(0.02716)	(0.06212)	(0.15304)	(0.15233)
	[8.35840]	[1.36957]	[-3.19812]	[0.39019]	[0.87833]
STOCK_RETURN(-2)	0.010909	0.012834	-0.030762	0.040269	-0.084370
	(0.02909)	(0.02731)	(0.06245)	(0.15386)	(0.15314)
	[0.37502]	[0.47000]	[-0.49256]	[0.26173]	[-0.55092]
EXCHAHNG_RATE__EUR__RETURN(-1)	0.012268	-0.013798	-0.038597	0.023239	0.024565
	(0.03086)	(0.02897)	(0.06626)	(0.16325)	(0.16249)
	[0.39748]	[-0.47623]	[-0.58247]	[0.14236]	[0.15118]
EXCHAHNG_RATE__EUR__RETURN(-2)	-0.009941	0.032872	-0.075998	-0.103384	-0.059677
	(0.03078)	(0.02890)	(0.06609)	(0.16283)	(0.16207)
	[-0.32291]	[1.13752]	[-1.14986]	[-0.63493]	[-0.36821]
OIL_RETURN(-1)	0.007160	-0.004169	0.212396	0.096743	-0.000664
	(0.01343)	(0.01261)	(0.02883)	(0.07103)	(0.07070)
	[0.53319]	[-0.33070]	[7.36704]	[1.36207]	[-0.00939]
OIL_RETURN(-2)	0.009491	0.005941	0.002527	-0.116718	-0.034127
	(0.01331)	(0.01250)	(0.02858)	(0.07042)	(0.07009)
	[0.71287]	[0.47536]	[0.08840]	[-1.65752]	[-0.48689]
DUMMY_VAT (-1)	0.002228	-0.002751	0.060543	0.995986	0.000244
	(0.00549)	(0.00515)	(0.01178)	(0.02902)	(0.02889)
	[0.40615]	[-0.53408]	[5.13960]	[34.3206]	[0.00845]
DUMMY_VAT (-2)	-0.001689	0.002825	-0.059789	0.002762	0.012784
	(0.00552)	(0.00518)	(0.01184)	(0.02917)	(0.02904)
	[-0.30628]	[0.54567]	[-5.04924]	[0.09466]	[0.44028]
DUMMY_COVID(-1)	0.001127	-0.000322	-0.003255	-0.000768	0.987253
	(0.00549)	(0.00516)	(0.01179)	(0.02905)	(0.02892)
	[0.20524]	[-0.06249]	[-0.27595]	[-0.02644]	[34.1369]
DUMMY_COVID(-2)	-0.001304	0.000325	0.003928	0.000738	-0.000244
	(0.00547)	(0.00513)	(0.01174)	(0.02891)	(0.02878)
	[-0.23850]	[0.06343]	[0.33472]	[0.02553]	[-0.00849]
C	0.000135	-0.000122	0.000226	0.001253	-6.31E-06
	(0.00020)	(0.00018)	(0.00042)	(0.00103)	(0.00103)
	[0.69090]	[-0.66692]	[0.54017]	[1.21464]	[-0.00615]
R-squared	0.063276	0.004008	0.087904	0.996376	0.995997
Adj. R-squared	0.055437	-0.004327	0.080272	0.996346	0.995963
Sum sq. resids	0.035573	0.031347	0.163972	0.995175	0.985989
S.E. equation	0.005456	0.005122	0.011714	0.028858	0.028724
F-statistic	8.072202	0.480829	11.51693	32858.41	29732.33
Log likelihood	4578.796	4655.056	3657.342	2570.000	2575.593
Akaike AIC	-7.575119	-7.701586	-6.047002	-4.243782	-4.253056
Schwarz SC	-7.528646	-7.655113	-6.000530	-4.197309	-4.206583
Mean dependent	0.000384	-7.86E-05	0.000826	0.350746	0.286070
S.D. dependent	0.005614	0.005111	0.012214	0.477402	0.452110

Determinant resid covariance (dof adj.)	7.25E-20
Determinant resid covariance	6.92E-20
Log likelihood	18046.28
Akaike information criterion	-29.83628
Schwarz criterion	-29.60392
Number of coefficients	55