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Iraqi Stock Exchange Reactions to the Oil price, Covid-19 Aftermath, and the Saudi Stock Exchange Movements pre-during Vaccination Program

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ABSTRACT

The study attempts to understand the influence of Brent oil price per barrel (BOP), the general index of 30 stocks in Saudi Arabia (MSCI30), the number of Covid-19 new infected cases (NIC_19), ounce gold price (OGP), and US dollar base to Iraqi Dinar exchange rate (USD_IQD) upon Iraq stock exchange (ISX60) using the daily period (25 February 2020-15 July 2021) divided into three subperiod; whole period pre-during covid-19, pre-Covid-19 and during Covid-19 vaccination process. The results indicate the long-run relationship between the regressors and the Iraq stock exchange in the subperiod before Covid-19 and during the Covid-19 vaccination process but did not appear for the whole period pre-during the covid-19 vaccination process. The results reveal a positive influence of (MSCI30 and USD_IQD) on ISX60 in the long term for a period before the Covid-19 vaccination process. And, the results indicate a negative influence of (BOP and OGP) respectively on (ISX60) in the long term, and (MSCI30) positively leads ISX60 in the long term during the Covid-19 vaccination process. The results are crucial to governments, investors, and policymakers because the Iraqi economic movements and stock exchange development need more highlight in the further studies, especially the vaccine discovery consequences.

Keywords: Brent Oil Price, Exchange Rate, Stock Market, Middle East, Covid-19
JEL Classifications: Q43, F31, D53, E44

1. INTRODUCTION

The spread of the Covid-19 pandemic forced new standards for restrictions by the world health organization (WTO) related to the societal severe consequences and slowdown in global economic activities. As a result, several enterprises' processes were obstructed, reduced production due to social distancing, and the lockdowns procedure led to losing jobs. Moreover, the increasing number of Covid-19 new infected cases led to a sharp decline in financial assets and market values except for gold metal (Phan and Narayan, 2020; Kyriazis, 2021; Unal et al., 2022). The pandemic of Covid-19 focuses more on some cost volatile, changes in the price and monetary policy, which influenced on financial market (Aslam et al., 2020; Asaad, 2021), then influenced the financial and economic system (Bahrini and Filfilan, 2020; Devpura, 2021). However, the stock market declined when Covid-19 infected cases grew (Al-Awadhi et al., 2020; Ashraf, 2020; Okorie and Lin, 2020; Chaudhry et al., 2021; Kyriazis, 2021; Nwosa, 2021). Hence, the linkage between the stock market and macroeconomics has been studied in abundance during the period of Covid-19 (Phan and Narayan, 2020; Prabheesh et al., 2020; Syahri and Robiyanto; 2020; Chien et al., 2021; Devpura, 2021; Kyriazis, 2021; Nwosa, 2021) but the results found mixed.

In spite of Iraq as a member of the thirteen countries' representative system of the Organization of the Petroleum Exporting Countries (OPEC) since 1960, but still, Iraq's economy was not of interest in the literature (Echchabi and Azouzi, 2017). The changes in oil

prices, the Covid-19 pandemic, high corruption, terrorist activities, local conflict, and political instability are still challenging to Iraq's business environment and economic progress (Asaad, 2014). The studies on case stock exchange in Iraq found that this market responded to the oil price fluctuation, newly infected cases of the Covid-19 pandemic, changes in the gold price, and the exchange rate (Asaad, 2021), but the results are still incompatible and controversial during the Covid-19 period.

In the period after the vaccine of Covid-19 pandemic was discovered and the vaccination process started by the public people from March 2021, which has offered hope for stability of stock return in the long-term period. The vaccination outputs were reduced economic uncertainty (Unal et al., 2022), more minor changes in unexpected government policy, then stock markets more stable (Rouatbi et al., 2021). The Covid-19 vaccination programs have been distributed worldwide to diminish the severe unfavorable influence of the pandemic as a prerequisite to going back to the usual social and economic conditions before the pandemic to achieving stability in international financial markets (Chan et al., 2021; Nguyen et al., 2022). Though the discovery of the Covid-19 vaccination still, the ultimate impact of vaccinations on the volatility of stocks may be vague and ambiguous (Demir et al., 2021).

Most studies' findings show that countries with low Covid-19 vaccination programs have higher volatility and lower performance in the stock markets (Unal et al., 2022). In addition, the literature still has not received the attention it deserves after the vaccine discovers during the Covid-19 period (Demir et al., 2021; Apergis et al., 2022; Unal et al., 2022). Moreover, no studies have investigated the interaction between macroeconomics and the stock market after the Covid-19 vaccine discovery, especially in developing countries such as Iraq. Furthermore, previous studies did not mention any linkage of the Iraq stock exchange with the regional stock markets, whether in GCC, MENA or even with the international markets, due to the small size of the market and its novel establishment after 2003. Therefore, the current study is going to fill the gap of limited studies conducted pre-during the Covid-19 vaccination programs in developing or oil-exporting countries like Iraq, and most past studies focused on the relationship between macroeconomics and the stock markets in developed countries (Abuoliem et al., 2019; Ali et al., 2020). Also, the study contributes to the existing literature through the investigation of the co-movement of the stock market in Iraq with the Saudi stock exchange, which could provide insights regarding the reaction of stock markets towards the changing stock cost in the Saudi stock market as the most extensive and highest impact in the middle east.

Although, there is still no consensus among the results of the empirical studies on the impact of macroeconomics variables on stock markets after vaccine discovery. Generally, the stock market responds adversely to the pandemic but positively to the vaccination program (Apergis et al., 2022). For that reason, this study considers the first endeavor to look over the influence of macroeconomics variables and the regional stock market on the Iraq stock exchange pre-during Covid-19 and during the vaccination program, which is applied especially to answer the question: what is the effect of oil price, Saudi stock exchange, Covid-19 new infected cases, gold price, and exchange rate on the Iraq stock exchange for three subperiod; whole period pre-during Covid-19 vaccination process, pre-Covid-19 and during Covid-19 vaccination process?. The rest of the current study proceeds as follows. Part 2 reviews the related literature. Part 3 specifies the methodology and model used. Meanwhile, part 4 presents discussions of empirical findings. Part 5 presents conclusions.

2. LITERATURE REVIEW

There are various variables instead of one that influences the financial market based on the Arbitrage Pricing Theory (Mustafa, 2020); hence the responses of the financial market to the many macroeconomics factors, especially before, during, and post-event, be under the attention more.

2.1. Before the Pandemic of Covid-19

Before the pandemic of Covid-19, the linkage has been verified positively or negatively between the stock market performances and macroeconomics variables in many contexts within previous studies (Kim, 2003; Hammoudeh and Li, 2005; Bjornland, 2009; Eryigit, 2009; Tsai, 2012; Arouri et al., 2015; Jain, 2016; Arfaoui and Rejeb, 2017; Echchabi and Azouzi, 2017; Al-Ameer et al., 2018; Akbar et al.; 2019; Abdul Kareem et al., 2020; Ali et al., 2020; Alshammari et al., 2020; Shabbir et al., 2020; Mustafa, 2020; Nguyen et al., 2020; Utama and Puryandani, 2020).

Some of the studies found a negative relationship between the oil price change and the stock market movements (Asaad and Marane, 2020; Mustafa, 2020), while others found a positive relationship between the variables (Hammoudeh and Li; 2005; Bjornland, 2009; Eryigit, 2009; Jain, 2016; Nguyen et al., 2020), and others indicated that there was weak or no relationship at all (Gokmenoglu and Fazlollahi, 2015). Several studies found a negative relationship between the gold price and the stock market (Akbar et al., 2019; Abdul Kareem et al., 2020; Ali et al., 2020; Alshammari et al., 2020; Shabbir et al., 2020), while others found a positive relationship between them (Arouri et al., 2015; Jain, 2016; Al-Ameer et al., 2018), in addition, others indicated that there was no relationship at all (Utama and Puryandani, 2020).

In the last two decades, many studies tested the availability of linkage between the developed and developing stock markets (Al-Najjar, 2022). Many studies' results presented evidence of having interdependence and interactions among the regional or global stock market indicators (Komlavi, 2010; Patel, 2017; Meng and Huang, 2019; Jiang and Yoon, 2020; Hung, 2021; Matar et al., 2021), and during the global economic decline (Aloui and Hkiri, 2014; Shahzad et al., 2017), in general, Saudi Arabia constitutes the bulk of GCC market capitalization and predominates the activities of these country markets (Bley and Chen, 2006). While some studies did not find stock market co-movement with each other (Paskelian et al., 2013), several studies' results indicated that there is no association between the developing and developed market (Fernandez, 2005). Meanwhile, many studies found a negative

relationship between the currency exchange rate and the stock market (Tsai, 2012; Arfaoui and Rejeb, 2017; Yarah, 2018; Ali et al., 2020; Mustafa, 2020; Utama and Puryandani, 2020), while others found a positive relationship between the variables (Akbar et al., 2019; Alshammari et al., 2020), and others indicated that there was no relationship between exchange rate and stock markets (Alsaor and Al-Jwejatee, 2021; Asaad and Marane, 2021). These empirical studies' results have clarified that the linkage between macroeconomics and the stock market is still inconsistent and debatable.

2.2. During the Pandemic of Covid-19

The pandemic of Covid-19 was revealed globally from December 2019 to March 2021. The event focused more on some cost volatile and changes in the price or monetary policy, which influenced the financial market (Aslam et al., 2020; Asaad, 2021) and influenced the financial and economic system (Aslam et al., 2020; Bahrini and Filfilan, 2020; Devpura, 2021). Nevertheless, the stock market declined when the number of Covid-19 infected cases grew up (Al-Awadhi et al., 2020; Ashraf, 2020; Okorie and Lin, 2020; Chaudhry et al., 2021; Kyriazis, 2021; Nwosa, 2021; Yousfi et al., 2021), whereas, a study found the negative linkage was insignificant (Liu et al., 2021). Hence, the linkage between the stock market and macroeconomics has been studied in abundance during the period of Covid-19, but the results found mixed (Al-Awadhi et al., 2020; Phan and Narayan, 2020; Prabheesh et al., 2020; Syahri and Robiyanto; 2020; Chien et al., 2021; Devpura, 2021; Kyriazis, 2021; Nwosa; 2021).

The oil price changes due to turbulence caused by the Covid-19 pandemic (Gharib et al., 2020; Prabheesh et al., 2020; Sun et al., 2020; Alemzero et al., 2021; Shehzad et al., 2021), and many studies discovered during the Covid-19 a negative relationship between the oil price and the stock market (Chien et al., 2021; Nwosa, 2021), whereas some found a positive relationship between them (Prabheesh et al., 2020), but also some indicated that there was no relationship at all (Kyriazis, 2021).

Many studies during the Covid-19 put in place a negative relationship between the Covid-19 pandemic indicators and the stock market (Al-Awadhi et al., 2020; Erdem, 2020; Qing et al., 2020; Salisu and Vo, 2020; Alzyadat and Asfoura, 2021; Hatmanu and Cautisanu, 2021; Li et al., 2021), but studies found very high fluctuation in the stock market during the Covid-19 period even higher than the financial crisis or global recession (Shehzad et al., 2021; Alkayed et al., 2022). While others found a positive relationship between Covid-19 and stock market volatility (Erdem, 2020; Nwosa, 2021; Alkayed et al., 2022), moreover, others indicated that there was an insignificant or weak relationship (Ashraf, 2020; Alkayed et al., 2022). Despite that, some sectors usually performed during the Covid-19 period, like healthcare, food, and technology stocks (Mazur et al., 2020). A study found that emerging stock markets are weaker to the uncertainty of pandemics and epidemics than developed market stocks, meaning that developed stock markets provide a better hedge against the uncertainty of pandemics and epidemics than emerging stock markets for the twenty-four emerging stock markets and twenty-one developed stock markets, hence the government policies have no significant impact on the effect of uncertainty of pandemics and epidemics on the emerging stock markets (Salisu et al., 2020).

In addition, the gold price responded positively to the pandemic of Covid-19 (Syahri and Robiyanto, 2020; Kouki and Imen Gallali, 2021; Chaudhry et al., 2021; Kumar and Robiyanto, 2021). Furthermore, there is almost consensus among studies results during covid-19 that an increase rapidly in the number of covid-19 deaths led to a decline in financial assets value except for gold (Kyriazis, 2021). A number of studies found during the Covid-19 the relatedness and interdependence among the regional or global stock market indicators (Youssef et al., 2021; Al-Najjar, 2022), while a few studies' results indicated weak connectedness and inverse relationship between the local and the international equity markets even under the impact of the Covid-19 pandemic (Amewu et al., 2022; Das and Gupta, 2022). Not very many studies during the Covid-19 found a negative relationship between the currency exchange rate and the stock market (Syahri and Robiyanto, 2020; Nwosa, 2021), while no study mentioned any positive relationship between the exchange rate and stock market during the pandemic, but some indicated that there was no evidence of any interaction at all (Chaudhry et al., 2021; Kumar and Robiyanto, 2021). A variety of empirical studies' results have clarified that the connection between macroeconomics and the stock market is still incompatible and controversial during the Covid-19 period (Asaad, 2021).

2.3. After the Vaccination of Covid-19 Pandemic

In the period after the vaccine of Covid-19 pandemic was discovered and the vaccination process started by the public from March 2021, which has offered hope for stability of stock return in the long-term period but still, the ultimate influence of vaccinations on the volatility of stocks may be ambiguous. Despite that, the vaccination outputs were reduced economic uncertainty, minor change in unexpected government policy, and stock markets became stable (Demir et al., 2021). The Covid-19 vaccination programs were distributed worldwide to diminish the severe unfavorable influence of the pandemic as a prerequisite to going back to the usual social and economic conditions before the pandemic to achieve stability in international financial markets (Nguyen et al., 2022).

Very few studies have been investigated the stock market determinants during the period of the Covid-19 vaccination process; for instance, a study documented that the vaccination process helped to reduce the energy stock based on data from the fifty-eight-stock market for the period during the Covid-19 outbreak from January 2020 to April 2021, and the influence of Covid-19 vaccinations on energy stock volatility is less noticeable in emerging markets rather than in developed markets (Demir et al., 2021), the results consistent with another study used daily data for sixty-six countries which presented that the vaccination programs contribute to reducing the volatility of the financial market and the effect is less explicit in emerging than in developed economies (Rouatbi et al., 2021). At the same time, a study on the linkage between human clinical trials for the Covid-19 vaccine and stock market returns from a global perspective found that the

positive reaction is more noticeable upon the start of third phase trials (Chan et al., 2021).

In another study, results found that the Covid-19 confirmed cases and deaths have a significant negative impact on the daily stock market returns in Canada and a positive impact on volatility over the period 27 January 2020 to 31 August 2021, and the vaccination program led to increases in Canadian stock returns and successfully achieving stability in the financial market (Apergis et al., 2022), this finding comes in line with another study in Malaysia which showed that the Covid-19 infected cases negatively affect the Kuala Lumpur Composite Index, and the index returns as the numbers vaccinated people increased during the period 28 February 2021 to 31 August 2021 (Mohd Hasan Abdullah et al., 2022). Meanwhile, the results of another study also confirmed that vaccination has an affirmative contribution to the forty-nine financial markets divided based on the date and vaccination rates (Unal et al., 2022). Furthermore, a study analysis results present evidence that the vaccinations have a significant positive impact on the US stock markets in the long term, whereas infected cases and stringency have a significant adverse effect on the US stock markets for the daily data during the period from 22 January 2020 to 30 April 2021using the ARDL bounds test approach, these results indicated that any public health emergency such as Covid-19 pandemic adversely effects on the financial markets (Mishra, 2022). Finally, there are no empirical studies yet that have investigated the interaction between macroeconomics and the stock market during the vaccination program period; therefore, this relationship is still incompatible and controversial after the vaccine discovers during the Covid-19 period (Demir et al., 2021; Apergis et al., 2022).

According to the above literature, most previous studies concentrated on the relationship between macroeconomics and the stock markets in developed countries (Abuoliem et al., 2019), even though the case continued during the Covid-19 pandemic. Although this, a few studies were dedicated to investigating the relationship between oil price, gold price, and stock markets (Gokmenoglu and Fazlollahi, 2015), especially in developing or emerging countries like Iraq during pandemics of Covid-19 (Asaad, 2021), still, there is no consensus among the results of the empirical studies of macroeconomics variables and stock markets.

Moreover, no studies have investigated the interaction between macroeconomics and the stock market after the Covid-19 vaccine discovery, especially in developing countries such as Iraq. Most past studies did not mention any linkage of the Iraq stock exchange with the regional stock markets such as GCC, MENA, or even the international markets due to the small size and its novel establishment after 2003. for that reason, this study differs from others because few studies were investigated during the period of the Covid-19 pandemic in developing countries or oil-exporting countries like Iraq, especially after vaccine discovery that the stock market responded adversely to the pandemic but positively to the vaccination program. In brief, this study is the first to examine the influence of macroeconomics variables and the regional stock market on the Iraq stock exchange pre-during Covid-19 and during the vaccination program is applied.

3. METHODOLOGY

3.1. Variables

3.1.1. Dependent variable

The stock market's performance in Iraq is measured by the daily closing price of the General Index (ISX60), representing the stock market's performance in Iraq. Moreover, the independent variables include the first independent variable as oil price measured by Brent crude oil price per barrel (BOP), the second variable is the Saudi stock exchange's performance as the biggest stock market in the middle east measured by the daily price of the general index MSCI TADAWUL 30 Index (MSCI30), the third variable is Covid-19 pandemic measured by the number of daily Covid-19 new infected cases (NIC_19), the fourth variable is the gold price measured by the daily price of one troy ounce of gold metal (OGP), and the fifth variable is the currency exchange rate measured by daily Iraqi Dinar with US Dollar (USD_IQD).

3.2. Data Sources

Table 1 presents the measurement of the variables and sources of gathered data for the three-panel periods: the whole study data pre-during Covid-19 period, from 25 February 2020 to 15 July 2021 with (257) observations, the pre-Covid-19 vaccination period from 25 February 2020 to 2 March 2021 with (174) observations, and during-Covid-19 vaccination period from 3 March 2021 to 15 July 2021 with (75) observations. Take into account some points; firstly, all variable data for the whole period is available daily. Secondly, the Covid-19 vaccination process started on 3 March 2021 in Iraq. Thirdly, the Arab markets value (13 stock markets) through 2020 reached (3077.73) billion dollars, while Saudi Arabia has occupied the first place in market value compared to other countries, which take (2426.89) billion dollars of Arab total market value as approximately about (78.85%) percentage of the whole Arab markets.

3.3. Objective and Hypothesis

The study aims are to investigate the long-run and short-run association between the Brent oil price (BOP), a general index of 30 stocks in Saudi Arabia (MSCI30), the number of Covid-19 new infected cases (NIC_19), Ounce gold price (OGP), and US dollar base to Iraqi Dinar exchange rate (USD_IQD) and the Iraq stock exchange index (ISX60) for three-period panels whole period, pre and during Covid-19 vaccination process. As a result, the null hypothesis formed based on the objective of the study, as there is no significant association between the oil price, Saudi Arabia stock exchange, Covid-19 new infected cases, gold price, exchange rate, and Iraqi stock exchange price for three-period panels whole period, pre and during Covid-19 vaccination process. In contrast, the alternative hypothesis is a significant association between the oil price, Saudi Arabia stock exchange, Covid-19 new infected cases, gold price, exchange rate, and Iraqi stock exchange price for three-period panels whole period, pre and during the Covid-19 vaccination process.

3.4. Material and Methods

To analyze the effects of explanatory variables such as Brent oil price (BOP), a general index of 30 stocks in Saudi Arabia (MSCI30), the number of COVID-19 new infected cases (NIC_19), Ounce gold price (OGP), and US dollar base to Iraqi Dinar exchange rate (USD_IQD) and the Iraq stock exchange

Table 1: Variables measurements and data sources

Variable	Group	Variable	Measurement	Acronym	Data source
DV1	Financial Market	Iraqi Stock Exchange Index	General Index of 60 selected stock	ISXI60	Iraq Stock Exchange Annual Reports
IV1	Commodity Market	Oil Price	Brent crude oil price per barrel	BOP	U.S Energy Information Administration Database
IV2	Financial Market	MSCI TADAWUL 30 Index	General index of 30 largest and most liquid stocks in Saudi Arabia	MSCI30	The Saudi Exchange website owned (Saudi Tadawul Group
IV3	Global health challenge	Infected Case	Number of COVID-19 new infected cases	NIC-19	Johns Hopkins University Center for Systems Science and Engineering (JHU CSSE)
IV4	Commodity Market	Gold Price	Price of one troy ounce of gold metal	OGP	The investing.com website
IV5	Monetary Market	Exchange Rate	US dollar base to Iraqi Dinar	USD_IQD	Central Bank of Iraq

index (ISX60) for three-period panels whole period, pre and during Covid-19 vaccination process. The study employs both quantitative methods and econometrics techniques. The descriptive statistics included using tables and graphs to figure out the movement of study variables during the period. While the econometrics methods involved the use of the unit root test like Augmented Dicky Fuller to check the stationary of the time series, Lag Order Selection Criteria (SC criterion) and cointegration test of ARDL bounds approach are used to understand the interaction between the variables for the three-period panels., Some diagnostic tests have been used to check the model validity, such as the serial correlation test, CUSUM, and CUSUMQ residuals test.

3.5. Model Specification

Several factors may impact the Iraq stock exchange development, and the effect of some of them on the stock market in Iraq investigated in this study, for instance, oil price, regional stock market, Covid-19 new infected cases, gold price, and exchange rate. Therefore, the following model is used to understand the Iraq stock exchange reaction.

The general model is ISXI60= f (BOP, MSCI30, NIC_19, OGP, USD_IQD)

The model rearranged in natural logarithm LISXI60t = β0 + β1 LBOPt + β2 MSCI30t + β3 NIC_19t + β4 OGPt + β5 USD_IQDt + μt

Where the dependent variable is defined as the (LISXI60t), the daily Iraq stock exchange index (ISX60), β0 is the model's intercept. Brent oil price (LBOPt) denotes the daily oil price per barrel, the general daily index of 30 stocks in Saudi Arabia is defined as the (LMSCI30t), the daily number of Covid-19 new infected cases (LNIC_19t), the daily Ounce gold price (LOGPt), and the exchange rate of the Iraqi dinar against the US dollar (LUSD_IQDt) are the explanatory variables. β1, β2, β3, and β4 are the parameters in the model, and the μt is the error term disturbances. The approach of Autoregressive Distributed Lag (ARDL) as an ordinary least square (OLS) model consisting of lags of both explained and explanatory variables:

$$ARDL(p,q): Y_t = \beta_0 + \sum_{i=1}^{p}\beta_i Y_{t-i} + \sum_{i=1}^{q}\delta_i X_{t-i} + \varepsilon_t$$

Short-run term specification: if there is no cointegration, the short-run ARDL (P, q1, q2, q3, q4, q5) model is specified as:

$$\begin{aligned}\Delta LISXI60t = a_{01} &+ \sum_{i=1}^{p} a_{1i}\Delta LISXI60_{t-i} + \sum_{i=1}^{q} a_{2i}\Delta LBOP_{t-1} \\ &+ \sum_{i=1}^{q} a_{2i}\Delta LMSCI30_{t-1} + \sum_{i=1}^{q} a_{3i}\Delta LNIC\_19_{t-1} \\ &+ \sum_{i=1}^{q} a_{3i}\Delta LOGP_{t-1} + \sum_{i=1}^{q} a_{4i}\Delta LUSD\_IQD_{t-1} + e_{1t}\end{aligned}$$

Long-run term specification: the error correction model (ECM) in case there is cointegration, representing is specified as:

$$\begin{aligned}LISXI60_t = a_{01} &+ b_{11}LISXI60_{t-i} + b_{21}LBOP_{t-i} \\ &+ b_{31}LMSCI30_{t-i} + b_{41}LNIC\_19_{t-i} + \\ &b_{51}LOGP_{t-i} + b_{61}LUSD\_IQD_{t-i} + e_{1t}\end{aligned}$$

Error correction model specification:

$$\begin{aligned}\Delta LISXI60t = a_0 &+ \sum_{i=1}^{p} a_{1i}\Delta ISXI60_{t-i} + \sum_{i=1}^{q} a_{2i}\Delta LBOP_{t-i} \\ &+ \sum_{i=1}^{q} a_{2i}\Delta LMSCI30_{t-i} + \sum_{i=1}^{q} a_{2i}\Delta LNIC\_19_{t-i} \\ &+ \sum_{i=1}^{q} a_{3i}\Delta LOGP_{t-i} + \sum_{i=1}^{q} a_{4i}\Delta LUSD\_IQD_{t-i} + \\ &\lambda ECT_{t-1} + e_t\end{aligned}$$

The test is based on the above equation, which Δ denotes the first difference; q is the optimum lag length, β_1 to β_5 are short-run dynamics of the model, e is the error term. In case the value of calculated F statistics is greater than the upper bound I(1) in the bound test, refer to the existence of cointegration and later must follow the error correction model, while in case the value of calculated F statistics is less than the lower bound I(0) no need to follow other steps and just limited to run ARDL short run based on OLS model. Where q1 to q5 is the optimal lag length and λ is the adjustment parameter's speed, and ECT represents the error correction term derived from the long-run association.

4. EMPIRICAL RESULTS

4.1. Descriptive Statistics

The descriptive statistics of the study are split into three panels whole period of the pre-during Covid-19 vaccination process, the period before-Covid-19 the vaccination process, and the period during-Covid-19 the vaccination process. The results for the first-panel whole sample pre-during the Covid-19 vaccination process are shown in Table 2 that the mean of the Iraq stock exchange index (ISX60) is 6.281 with a standard deviation of 0.107. The mean brent oil price per barrel (BOP) is 3.927 with a standard deviation of 0.263, the mean of the general index of 30 stocks in Saudi Arabia (MSCI30) is 7.054 with a standard deviation of 0.138, the means a number of Covid-19 new infected cases (NIC_19) is 3273.903 with a standard deviation of 2306.488, the mean of an ounce gold price (OGP) is 7.513 with standard deviations of 0.050, the mean of US dollar base to Iraqi Dinar exchange rate (USD_IQD) is 7.167 with standard deviations of 0.102. Whereas, the mean of (ISX60, BOP, MSCI30, NIC_19, OGP and USD_IQD) are (6.16, 3.8, 6.981, 7.282, 7.528 and 7.121) with standard deviations of (0.064, 0.211, 0.087, 1.373, 0.049 and 0.082) respectively for the second panel before Covid-19 vaccination process. In addition, the mean for of (ISX60, BOP, MSCI30, OGP and USD_IQD) are (6.362, 4.228, 7.231, 8.636, 7.487 and 7.285) with standard deviations of (0.022, 0.062, 0.049, 0.314, 0.029, 0.00) respectively for the last panel during Covid-19 vaccination process.

4.2. Correlation Analysis

The correlation matrix is shown in Table 3 which brings out that the Brent oil price, a general index of 30 stocks in Saudi Arabia, and ounce gold price have a negative correlation, while the number of Covid-19 new infected cases and the US dollar base to Iraqi Dinar exchange rate have a positive correlation with the Iraq stock exchange index (ISX60) for the first panel of pre-during Covid-19 vaccination process. Whilst, the results bring out that all explanatory variables have a positive correlation with the Iraq stock exchange index (ISX60) for the second panel before the Covid-19 vaccination process. Also, the findings dedicated that Brent oil price, a general index of 30 stocks in Saudi Arabia, and ounce gold price have a negative correlation, while the number of Covid-19 new infected cases and the US dollar base to Iraqi Dinar exchange rate have a positive correlation with the Iraq stock exchange index (ISX60) for the last panel during Covid-19 vaccination process. In last, different correlation results between the explanatory variables and explained variables are based on the period panels.

4.3. Unit Root Tests

The study employed the Philip Perron (PP) and Augmented Dickey-Fuller (ADF) unit root test for stationary as the first step, the estimated findings of the unit root test are shown in Table 4, indicating that some variables are stationary at the level and some are non-stationary but become stationary at first difference based on the PP test and ADF test results. This means that the unit root tests are a mixture of stationary at the level I(0) and at the first difference I(1) for all period panels. hence, the study cannot proceed with the Johansen Co-integration test but can proceed with the Auto-regressive Distributive Lag (ARDL) model due to the series being mixed order of integration.

Table 2: Descriptive statistics

Variable	ISX60	BOP	MSCI30	NIC_19	OGP	USD_IQD
Panel I: Before-during the Covid-19 vaccination process						
Mean	6.218	3.927	7.054	3273.903	7.513	7.167
Median	6.182	3.914	7.048	3221.000	7.517	7.080
Maximum	6.409	4.346	7.294	9635.000	7.619	7.286
Minimum	6.006	3.018	6.703	1.000	7.313	7.075
SD	0.107	0.263	0.138	2306.488	0.050	0.102
Skewness	0.270	-0.449	0.059	0.628	-0.593	0.307
Kurtosis	1.874	2.926	2.319	2.978	3.939	1.094
Observations	257	257	257	257	257	257
Panel II: Before the Covid-19 vaccination process						
Mean	6.1605	3.8009	6.9861	7.2828	7.5281	7.1210
Median	6.1728	3.7769	6.9953	7.7326	7.5309	7.0797
Maximum	6.3346	4.2053	7.1286	8.5244	7.6188	7.2862
Minimum	6.0060	3.0185	6.7027	2.3979	7.3132	7.0749
SD	0.0641	0.2115	0.0874	1.3732	0.0492	0.0826
Skewness	0.1121	-0.6279	-0.7811	-1.9438	-1.3146	1.4908
Kurtosis	3.5142	4.2709	3.3725	6.1433	6.3628	3.2230
Observations	174	174	174	174	174	174
Panel III: During the Covid-19 vaccination process						
Mean	6.362	4.228	7.231	8.636	7.487	7.285
Median	6.362	4.224	7.242	8.563	7.484	7.285
Maximum	6.409	4.346	7.294	9.173	7.549	7.286
Minimum	6.321	4.107	7.124	7.629	7.428	7.284
SD	0.022	0.062	0.049	0.314	0.029	0.000
Skewness	0.062	0.201	–0.630	–0.264	0.448	2.031
Kurtosis	1.956	1.937	2.205	3.037	2.448	10.717
Observations	75	75	75	75	75	75

Source: Researcher's construction using EViews 10

Table 3: Correlation matrix

Variable	LISX60	BOP	MSCI30	NIC_19	OGP	USD_IQD
Panel I: Before-during the Covid-19 vaccination process						
ISX60	1	–0.48413	–0.25449	0.240031	–0.32986	0.169463
BOP	–0.48413	1	0.826186	0.122841	0.58405	0.056042
MSCI30	–0.25449	0.826186	1	0.144743	0.739962	–0.02776
NIC_19	0.240031	0.122841	0.144743	1	–0.18613	0.068056
OGP	–0.32986	0.58405	0.739962	–0.18613	1	–0.06194
USD_IQD	0.169463	0.056042	–0.02776	0.068056	–0.06194	1
Panel II: Before the Covid-19 vaccination process						
ISX60	1	0.680312	0.750132	0.378004	0.240695	0.554206
BOP	0.680312	1	0.825211	0.483334	0.285808	0.690432
MSCI30	0.750132	0.825211	1	0.567159	0.406356	0.574016
NIC_19	0.378004	0.483334	0.567159	1	0.799372	–0.05438
OGP	0.240695	0.285808	0.406356	0.799372	1	–0.12408
USD_IQD	0.554206	0.690432	0.574016	–0.05438	–0.12408	1
Panel III: During the Covid-19 vaccination process						
ISX60	1	–0.48413	–0.25449	0.240031	–0.32986	0.169463
BOP	–0.48413	1	0.826186	0.122841	0.58405	0.056042
MSCI30	–0.25449	0.826186	1	0.144743	0.739962	–0.02776
NIC_19	0.240031	0.122841	0.144743	1	–0.18613	0.068056
OGP	–0.32986	0.58405	0.739962	–0.18613	1	–0.06194
USD_IQD	0.169463	0.056042	–0.02776	0.068056	–0.06194	1

Source: Researcher's construction using EViews 10.

Table 4: Augmented Dickey-Fuller (ADF) test

PP test								ADF test					
		ISX60	BOP	MSCI30	NIC_19	OGP	USD_IQD	ISX60	BOP	MSCI30	NIC_19	OGP	USD_IQD
Panel I: Before-during the Covid-19 vaccination process													
I (0)	C	–1.859	–1.021	–0.459	–1.293	–2.342	–0.860	–0.570	–0.856	–0.513	–1.247	–2.533	–0.860
	C&T	–4.599*	–4.472*	–5.256*	–2.601	–2.3125	–2.1147	–2.511	–4.373*	–5.181*	–2.028	–2.54	–2.102
I (1)	C	–36.981*	–15.351*	–17.817*	–17.945*	–15.868*	–16.105*	–12.430*	–5.922*	–9.850*	–4.942*	–15.44*	–16.105*
	C&T	–38.419*	–15.387*	–17.832*	–18.330*	–15.963*	–16.077*	–12.418*	–5.808*	–9.845*	–4.960*	–15.441*	–16.077*
Panel II: Before the Covid-19 vaccination process													
I (0)	C	–2.432	–1.483	–1.061	–3.619*	–1.903	–0.490	0.249	–1.210	–2.600	–3.482*	–2.190	–0.490
	C&T	–5.938*	–3.686**	–4.847*	–3.141	–1.342	–1.648	–4.182*	–3.586**	–4.448*	–3.044	–1.822	–1.652
I (1)	C	–36.087*	–12.550*	–15.211*	–14.054*	–13.429*	–13.564*	–11.009*	–12.473*	–8.018*	–14.055*	–12.907*	–13.564*
	C&T	–35.610*	–12.614*	–15.229*	–14.283*	–14.641*	–13.614*	–11.198*	–12.57*	–8.024*	–14.300*	–12.998*	–13.614*
Panel III: During the Covid-19 vaccination process													
I (0)	C	–2.282	–1.338	–2.179	–2.443	–1.449	–10.660*	–2.043	–0.673	–2.205	–2.498	–1.261	–10.660*
	C&T	–2.719	–4.105*	–2.184	–2.480	–2.645	–10.574*	–2.605	–4.164*	–2.184	–2.526	–2.340	–10.574*
I (1)	C	–7.451*	–11.700*	–8.387*	–8.755*	–8.297*	–31.109*	–7.478*	–9.411*	–8.371*	–8.019*	–8.276*	–12.502*
	C&T	–7.522*	–11.599*	–8.561*	–8.635*	–8.272*	–31.65*	–7.509*	–9.339*	–8.560*	–7.967*	–8.246*	–12.441*

Source: Researcher's construction using EViews 10. Note: (*, **) Significant at the (1%, 5%) respectively. *MacKinnon (1996) one-sided *P* values.

4.4. Lag Length Selection

The PP and ADF unit root test results found that the series are having a combination and mixed order of integration of both at the level I(0) and the first difference I(1), the following step is to identify the lag order length for the ARDL model. The optimal lag length is selected automatically by Eviews10 software utilizing four lags inspected statistics test (LogL, LR, FPE, AIC, SC, HQ). The estimated outputs of optimal lag lengths are suggesting one lag based on SC criteria as illustrated in Table 5 for all period panels whole sample, before and during the Covid-19 vaccination process.

4.5. Cointegration Bound Test

A combination order of integration at the level I(0) and the first difference I(1) in unit root test results lead to the use of the bounds cointegration test to examine of no cointegration (no long-run equilibrium) hypothesis between explanatory variables as Brent oil price (BOP), a general index of 30 stocks in Saudi Arabia (MSCI30), number of Covid-19 new infected cases (NIC_19), Ounce gold price (OGP), and US dollar base to Iraqi Dinar exchange rate (USD_IQD) with the Iraq stock exchange index (ISX60) for three-period panels before and during Covid-19 vaccination process. The bound results in Table 6 present evidence that the calculated value of the F-statistic is (2.84343) is located between the lower bound I(0) and upper bound I(1) at 5% of statistical significance, hence no decision of cointegration could be made due to the bound results are inconclusive for the pre-during Covid-19 vaccination process. While the calculated value of the F-statistic for the both period before-Covid-19 and the period during-Covid-19 vaccination process respectively (6.516973 and 5.104441) are higher than the upper bound I(1) at 5% of statistical significance. Thus, the decision is that the variables are cointegrated and accept the alternative hypothesis of the existence

Table 5: Lag Order Selection Criteria (SC criterion)

Panel I: Before-during the Covid-19 vaccination process (Observation 249)						
Lag	**LogL**	**LR**	**FPE**	**AIC**	**SC**	**HQ**
0	–550.718	NA	3.52E-06	4.471627	4.556385	4.505743
1	1281.35	3561.126	1.91E-12	–9.95462	–9.361309*	–9.7158
2	1356.303	142.0796	1.40E-12	–10.2675	–9.165638	–9.82398
3	1380.432	44.5772	1.54E-12	–10.1722	–8.561747	–9.52394
Panel II: Before the Covid-19 vaccination process (Observation 166)						
0	1107.514	NA	6.94E-14	–13.27125	–13.15877	–13.2256
1	2264.44	2216.279	9.47E-20	–26.77638	–25.98901*	–26.4568
2	2304.844	74.47987	9.00E-20	–26.82944	–25.36718	–26.2359
3	2340.119	62.47524	9.11E-20	–26.82071	–24.68356	–25.9532
Panel III: During the Covid-19 vaccination process (observation 75)						
0	1137.612	NA	3.16E-21	–30.17631	–29.99091	–30.10228
1	1462.774	589.6274*	1.42e-24*	–37.88730*	–36.58951*	–37.36911*
2	1490.104	45.18555	1.82E-24	–37.6561	–35.24591	–36.69374
3	1509.519	28.99312	2.97E-24	–37.21383	–33.69125	–35.80731

Source: Researcher's construction using EViews 10.

* Indicates lag order selected by the criterion, LR: sequential modified LR test statistic (each test at 5% level), FPE: Final prediction error, AIC: Akaike information criterion, SC: Schwarz information criterion, HQ: Hannan-Quinn information criterion.

Table 6: ARDL bound test

Null Hypothesis: No levels of relationship						
Test Statistics	**F-statistics**	**t-statistics**	**K**	**Actual Sa.**	**Model**	**Coint.**
Before-during Covid-19 vaccination process	2.84343	–2.428015	5	251	(5,6,6,0,4,5)	No
Before the Covid-19 vaccination process	6.516973	–4.285444	5	173	(3,3,4,1,2,4)	Yes
During the Covid-19 vaccination process	5.104441	–4.665958	5	75	(4,2,0,0,3,0)	Yes
Critical bound value	Significance	I (0)	I (1)	Significance	I (0)	I (1)
	10%	2.26	3.35	2.5%	2.96	4.18
	5%	2.62	3.79	1%	3.41	4.68

Source: Researcher's construction using EViews 10

of cointegration between the Iraq stock exchange index (ISX60) and its regressors for both periods.

4.6. Long-Run and Short-Run Estimates

The ARDL approach of cointegration short-run and long-run results of study reports in Table 7, based on the bound test, BOP, MSCI30, NIC_19, OGP, and USD_IQD appear as long-run variables that influence ISX60 for the period before the Covid-19 and during the Covid-19 vaccination process period, this results in line with Asaad (2021). While regressors do not appear as long-run variables that influence ISX60 for the whole period pre-during the Covid-19 vaccination process, this result is opposite to Asaad (2021).

The long-run results for a period before the Covid-19 vaccination process demonstrate that the Brent oil price per barrel (BOP), number of Covid-19 new infected cases (NIC_19), an ounce gold price (OGP) do not have a significant effect on the Iraq stock exchange index (ISX60), this result in somehow is consistent with (Ashraf, 2020; Kyriazis, 2021; Alkayed et al., 2022), but the Saudi Arabia stock index (MSCI30) and US dollar to Iraqi Dinar exchange rate (USD_IQD) have a significant positive effect on the Iraq stock exchange index (ISX60) at the 10% level, this results in line with (Youssef et al., 2021; Al-Najjar, 2022), meaning a 1% increase in (MSCI30, USD_IQD) respectively lead to a (44%, 29%) increase in ISX60 in the long-run, while the long-run results for the period during the Covid-19 vaccination process demonstrate that the Brent oil price per barrel (BOP), ounce gold price (OGP) has a significant negative effect, and the Saudi Arabia stock index (MSCI30) has a significant positive effect on the Iraq stock exchange index (ISX60) at the 5% level, this output strengthens the results of (Chien et al., 2021; Nwosa, 2021; Youssef et al., 2021; Al-Najjar, 2022;), meaning a 1% increase in (BOP, OGP) respectively lead to a (43%, 42%) adverse in ISX60 in long-run and a 1% increase in (MSCI30) lead to a (53%) increase in ISX60 in long-run, while the number of Covid-19 new infected cases (NIC_19) and US dollar to Iraqi Dinar exchange rate (USD_IQD) are insignificant with the Iraq stock exchange index (ISX60), this results similar in some way with (Ashraf, 2020; Chaudhry et al., 2021; Kumer, 2021; Alkayed et al., 2022).

The short-run results of the before-during Covid-19 vaccination process indicate that only one lagged (ISX60, BOP, OGP) has a significant effect on the Iraq stock exchange index (ISX60) in the short term, meaning a 1% increase in one lagged (ISX60, BOP) respectively leads to a (41%, 14%) decrease in ISX60 in short-run, and a 1% increase in (OGP) lead to a (44%) increase ISX60 in short-run, this result is consistent one way or another with (Akbar et al., 2019; Abdul Kareem et al., 2020; Ali et al., 2020; Alshammari et al., 2020; Asaad and Marane, 2020; Prabheesh et al., 2020; Shabbir et al., 2020).

While the short-run results before the Covid-19 vaccination process indicate that only one lagged (ISX60, BOP, OGP) respectively has a significant effect on the Iraq stock exchange index (ISX60) in the short-run, meaning a 1% increase in one lagged (ISX60, BOP)

Table 7: Estimate short-run Causal model: LISX60 as Dependent Variable

	Before-during Covid-19 vaccination process		Before the Covid-19 vaccination process		During the Covid-19 vaccination process	
	Coefficient	Prob.	Coefficient	Prob.	Coefficient	Prob.
Long run coefficients - Dependent variable is LISX60						
LBOP	No cointegration		0.103792	0.3104	–0.43769	0.0002
LMSCI30	0.44003		0.0187	0.530365	0.0020	
LNIC_19	0.000495		0.9698	0.009074	0.4525	
LOGP	0.252634		0.3887	–0.42976	0.0500	
LUSD_IQD	0.297354		0.0985	–2.50683	0.8134	
Short Run Coefficients - Dependent variable is D (LISX60)						
Constant	0.000884	0.5777	0.001908	0.3694	–6.66E-07	0.9995
D (LISX60(–1))	–0.41172	0.0000	–0.29553	0.0001	0.345015	0.0111
D (LBOP)	–0.03147	0.4705	–0.08324	0.1564	–0.13018	0.0055
D (LBOP(–1))	–0.14252	0.0006	–0.28118	0.0000	0.078584	0.1551
D (LMSCI30)	0.110318	0.2456	0.117157	0.486	0.083198	0.5373
D (LMSCI30(–1))	0.140696	0.1594	0.119187	0.4465	–0.02473	0.7995
D (NIC_19)	2.02E-06	0.4312	5.59E-06	0.2644	8.50E-08	0.9437
D (NIC_19(–1))	4.21E-07	0.8698	3.25E-06	0.5209	–5.43E-07	0.6537
D (LOGP)	–0.02803	0.8252	–0.19478	0.2254	0.138513	0.199
D (LOGP(-1))	0.443696	0.0003	0.328333	0.0336	0.001301	0.9889
D (LUSD_IQD)	0.004174	0.9731	0.090346	0.5054	0.728134	0.7417
D (LUSD_IQD(–1))	–0.10142	0.4209	–0.05569	0.6874	–2.3008	0.2474
ECT(–1)			–0.28905	0.0000	–0.2852	0.0000
R-squared	0.276737		0.427719		0.300334	
Adjusted R-squared	0.243997		0.384797		0.162695	
Durbin-Watson stat	2.031772		1.903042		2.040497	
F-statistic	8.452507		9.965227		0.023862	
Prob (F-statistic)	0.000000		0.00000		0.000001	
lag	1		1		1	
Obs. after adjustments	255		173		74	

Source: Researcher's construction using EViews 10.

respectively leads to a (29%, 28%) decrease ISX60 and a 5% increase in (OGP) lead to a (32%) increase ISX60 in the short-run, this result is no different one way or another with (Arouri et al., 2015; Jain, 2016; Al-Ameer et al., 2018; Akbar et al., 2019; Abdul Kareem et al., 2020; Ali et al., 2020; Alshammari et al., 2020; Shabbir et al., 2020). Moreover, the short-run results during the Covid-19 vaccination process indicate that one lagged (ISX60) and (BOP) has a significant effect on the Iraq stock exchange index (ISX60) in the short-run, meaning a 1% increase in one lagged (ISX60) leads to a (34%) increase ISX60 in short-run and a 1% increase in (OGP) lead to a (13%) decrease ISX60 in short-run, this result is not similar one way or another with previous studies (Jain, 2016; Nguyen et al., 2020) due to Iraq stock exchange is inefficient and still have a small value because of the small size of the market.

The study subperiods clarified the nonsignificant impact of explanatory variables in the short run due to the fact of improperly allocating resources in the process of economic development of the country because of management inefficiency and preference for the individual interest over the public interest; therefore, Iraq faces a huge challenge in last two decade such as unattractive investment environment, a collapsed industrial and service environment and loss of a safe and stable environment.

Despite Saudi Arabia constituting the bulk of GCC market capitalization and predominating the activities of these country markets (Bley and Chen, 2006) but still, the Iraq stock exchange has not interacted with it in the short run due to its small size and its novel establishment after 2003, this results in agreement with (Paskelian et al., 2013). The study indicated that the investors could use gold as a suitable alternative in the long run or short run as a hedge against inflation in Iraq due to the significant effect of gold price on the stock price in one period and not in another. While the effect of the exchange rate (USD_IQD) is insignificant to the stock market almost in all periods in the long or short run, the results have come in line with some studies (Devpura, 2021) and show a difference from others (Ali et al., 2020; Utama and Puryandani, 2020), this result come out since the success of the financial policy set by the central bank in Iraq to control and to conserve the raising of national currency value by the currency auction to achieving the stability of Iraqi Dinar against the Dollars currency (Akkawi and Salman, 2014; Dagher and Mohamed, 2017). Hence Iraqi currency change is not a barrier forwards the investors in real sectors of the economy.

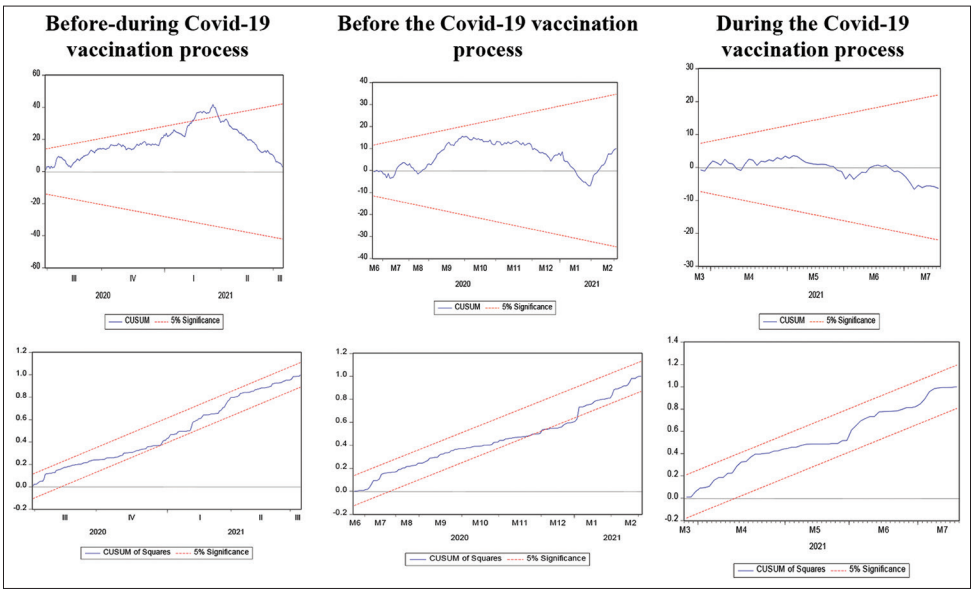
Over the above, Table 7 exhibits the error correction term (ECT) a long-run association between the Iraq stock exchange index (ISX60) and its regressors, meaning that the Iraq stock exchange index (ISX60) and its regressors are moving together with a value of (–0.28905, –0.2852) at 1% level of significance respectively for both period before Covid-19 and during Covid-19 vaccination process. The coefficient of ECT lagged by one period embraces a relative speed adjustment process back to the equilibrium in

Table 8: Breusch-Godfrey serial correlation LM test

Breusch-Godfrey serial correlation LM test:				
Panel	**F-statistic**	**Obs*R-squared**	**Prob. F**	**Prob. Chi-square (1)**
Before-during Covid-19 vaccination process	0.250841	0.264042	0.6169 (1, 242)	0.6074
Before the Covid-19 vaccination process	0.997866	1.078957	0.3193 (1, 159)	0.2989
During the Covid-19 vaccination process	0.282916	0.347292	0.5968 (1,160)	0.5557

Source: Researcher's construction using EViews 10.

Figure1: Stability CUSUM and CUSUM of Square of recursive residuals



the model with (28%) adjustment of deviation or disequilibrium in the model will be corrected within one period, also the negative sign and statistically significant concede as evidence of promotes the presence of long-run relationship between Iraq stock exchange index (ISX60) and it is regressors for both period panels of before Covid-19 and during Covid-19 vaccination process, meaning that directly estimate the quick at which a dependent variable returns to equilibrium after a change in other regressors.

4.7. Diagnostic Tests

The diagnostic tests result of serial correlation emphasize that the model is not facing the problem of autocorrelation due to the P-value of the Breusch-Godfrey serial Correlation LM test being higher than 5% as shown in Table 8 for all period panel.

The results of the stability test are present in Figure 1, and verify that the cumulative sum CUSUM and the cumulative sum CUSUM of the square test within the boundaries at 5% significance for the all-period panels except for the cumulative sum CUSUM of the square test for the period panel before Covid-19 vaccination process which has become stable again and makes the overall models is reliable in line with Brown et al.'s (1975).

5. CONCLUSIONS

The study utilized the ARDL bounds test to investigate the influence of brent oil price per barrel (BOP), general index of 30 stocks in Saudi Arabia (MSCI30), number of COVID-19 new infected cases (NIC_19), ounce gold price (OGP) and US dollar to Iraqi Dinar exchange rate (USD_IQD) on daily Iraq stock exchange index (ISX60) for the period 25 February 2020 to 15 July 2021, which divided into three subperiod; period pre-during Covid-19, pre-Covid-19 and during Covid-19 vaccination process.

The cointegration model indicated the long-run relationship between the ISX60 and its regressors in the subperiod before Covid-19 and during the Covid-19 vaccination process but did not appear the long-run relationship among variables for the period pre-during covid-19 vaccination process. Besides, there is a negative or positive correlation between the ISX60 with its regressors for study period panels. The results reveal that a 1% increase in (MSCI30 and USD_IQD) leads to a (44%, 29%) increase in ISX60 in the long run. Still, the other variables do not significantly affect the Iraq stock exchange index (ISX60) for a period before the Covid-19 vaccination process. In addition, the results reveal that a 1% increase in (BOP and OGP) leads to a (43% and 42%) decrease in ISX60 in the long run. Conversely, a 1% increase in (MSCI30) shows a (53%) increase in ISX60 in the long run. Still, the other variables do not significantly affect the Iraq stock exchange index (ISX60) for the period during the Covid-19 vaccination process.

The study contributes to the literature by highlighting the impact of macroeconomics variables on the stock market after the Covid-19 vaccine discovery, especially since earlier studies have not touched

developing countries such as Iraq. Also, it contributes to filling the gap of limited studies that tested the interaction of the Iraq stock exchange with global markets or regional markets, for instance, GCC, and MENA, due to its small size and its novel establishment after 2003. It could provide insights regarding the reaction of stock markets towards changing the Saudi stock cost as the most extensive and highest impact in the middle east. In addition, there is still no consensus among the results of the empirical studies on the effects of macroeconomics variables on stock markets after vaccine discovery due to the stock market responding adversely to the pandemic but positively to the vaccination program (Apergis et al., 2022). For that reason, this study considers the first endeavor to examine the influence of macroeconomics variables and the regional stock market on the Iraq stock exchange pre-during Covid-19 and during the vaccination program. Because of that, the study results are crucial to governments, investors, and policymakers.

The Iraqi economic movements and stock exchange development need more highlight in the further studies, particularly in the aftermath of the Covid-19 pandemic and with consequences of the vaccine discovery, to determine the location of Iraq in the middle east by comparing it, especially with other Arab economic and stock markets.

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