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Effect of Oil Prices, Inflate Rate, Energy Consumption, Gross Domestic Product on Stock Market Performance of Iraq Stock Exchange

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Abstract: Oil prices (OP), inflation rate (INF), energy consumption (EC), and gross domestic product (GDP) have had a substantial impact on the performance of the stock market (SMP). Therefore, the primary purpose of this study is to investigate the effects of various macroeconomic factors on the SMP in Iraq. The all-share price index (ASPI) is a proxy for the stock market's performance. In contrast, GDP, INF, EC, and OP are macroeconomic indicators. All companies traded on the Iraq Stock Exchange comprised the population for examination in this study. The information was acquired from secondary sources, and annual time series data for 2000 through 2021 were utilized. Correlation and multiple regressions were employed as statistical methods to analyze the data and test the hypotheses' validity. In addition, the Augmented Dicky-Fuller (ADF) test, the Breusch-Pagan-Godfrey test, and the Variance inflation factor (VIF) were used to determine multicollinearity. According to the research, GDP and OP have a beneficial effect on SMP. Both INF and EC are detrimental to the SMP. The findings of this study will aid investors and scholars in the fields of economics and finance in their quest for a deeper knowledge of how macroeconomic variables affect the stock market's performance. Incorporating numerous macroeconomic variables and their link with the stock market also provides scholars and the general public with insightful information.

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1. Introduction

The function of stock markets in economic progress and national prosperity is crucial (Teweles et al., 1998). A well-functioning stock market is one of the most important aspects of a nation's long-term development (Barsky et al., 1993). The researchers examine the relationship between macroeconomic variables and stock market performance (SMP) in developed and emerging economies (Liu et al., 2017). The worldwide economy is dependent on the stock market since the emerging economy is affected by its expansion (Barsky et al., 1993). Because of this, businesses, the central bank, and the government are concerned with the share market's movement (Morck et al., 1990). New securities are issued to the public for the first time in the primary market, whereas in the secondary market, previously published equities are traded (Bosworth et al., 1975). In contrast, on the over-the-counter market, stock transactions are conducted directly between two parties without the supervision of an exchange (Jung et al., 2005).

The prior discussion demonstrated the necessity of SMP. The Iraqi stock exchange also creates a controlled environment where individual and institutional investors can collaborate (Ali, 2019). According to Haruna (2019), an institution's common stock is exchanged on a stock exchange. Performance of the stock market (SMP) refers to the returns shareholders obtain on their investments (Aljawaheri et al., 2021). The return may be in the form of earnings from trading activities or dividends distributed periodically by the organization to its investors (Asaad, 2021). The nation's strengths and shortcomings are revealed by macroeconomic variables (Asaad, 2021). Rashid et al. (2017) and Asaad (2021) argue that energy consumption (EC), inflation rate (INF), oil prices (OP), and gross domestic product (GDP) are significant macroeconomic variables that can influence the performance of the stock market (SMP). Examining the influence of macroeconomic variables on the stock market is of greater interest to academics, regulators, scholars, investors, and the government. The stock market reflects nations' economic prosperity, which is an important economic indicator (Prahalathan, 2017).

As a result, the stock market plays a vital role in a rising economy. Consequently, more scholars and policymakers have focused on studies about stock markets. Existing research has demonstrated the influence of macroeconomic variables on SMP from many perspectives (Abuoliem et al., 2019). Few academics have suggested that certain macroeconomic conditions positively affect SMP. Although some scholars, such as (Bora et al., 2020), give inconsistent evidence that macroeconomic variables and SMP have a strong negative association, this is not the case. However, few studies have found no correlation between macroeconomic parameters and stock market indicators (Ahmad et al., 2012). These contradicting concepts confound the mind of the policymaker. Although most studies on the relationship between macroeconomic variables and SMP have been conducted in industrialized nations like as Japan, the United States, and Turkey (Gong et al., 2021), there is a shortage of research on emerging nations, particularly the Iraq stock market. Since there are not a significant number of sources or previously conducted research on Iraq's SMP, it would be prudent to conduct additional research on its future course. The performance of the Iraqi stock market has changed significantly in recent years. As market capitalization declined, the performance of the Iraq stock market starkly contrasted with the positive performance achieved in 2017. (Asaad, 2021). Due to the lack of consistency in economic policies and the political instability of the government, there are fluctuations and a downward trend in the stock market's performance. This affects the stock market because macroeconomic indicators are also affected along with their economic policies. Important macroeconomic factors in Iraq have demonstrated large variations throughout time.

Few studies were conducted on analyzing the impacts of macroeconomic variables on the (Asaad, 2021; Hassan et al., 2019; Majeed, 2022), but these studies have primarily focused on the impact of the inflation rate and oil prices on the stock market, while energy consumption and gross domestic product have received little attention. In addition to these two macroeconomic indicators, a study of macroeconomic variables and SMP in Iraq is required. The Iraq Stock Exchange is selected because it is the sole stock exchange in Iraq. This study examines the impact of macroeconomic indices, including oil prices, gross domestic product, energy consumption, and inflation rate, on SMP from 2000 to 2021. According to the existing literature, there appears to be no consensus regarding the influence of macroeconomic variables on SMP. Therefore, the present work contributes to the existing literature in multiple approaches. This study contributes to the existing knowledge by investigating the relationship between macroeconomic variables and SMP in a newly emerging economic power. It aids in gaining a deeper understanding of macroeconomic forces' impact on developing markets, which have different structures, institutions, and governing bodies than developed markets. It has significant practical value since its econometric conclusions facilitate the implementation of appropriate regulatory, financial, and economic policies. The financial analysts, owners, and other stakeholders will use the study's findings to improve their decision-making. The research findings and subsequent policy recommendations may serve as a beneficial reference for policymakers to carefully manage the macroeconomic dynamics to improve the SMP of Iraq to formulate economic objectives and policies.

2. Literature Review and Hypothesis Development

Numerous macroeconomic factors and capital market studies have been undertaken worldwide, but the results are inconclusive due to the diversity of economic conditions. The study examined the behavior of the stock market from multiple perspectives and within diverse theoretical frameworks.

2.1 Theoretical Review

The theoretical framework comprises three distinct theories: the efficient market hypothesis, the capital asset pricing model, and the arbitrage pricing theory. (Arshad et al., 2021) is credited with developing the "Efficient Market Hypothesis (EMH) investment hypothesis asserts that share prices" Moreover, investing in high-risk securities is a significant method for investors to achieve higher returns, and being a skilled stock trader should make it challenging to exceed the market as a whole. The Capital Assets Pricing Model (CAPM) was also developed (Siddiqui et al., 2019). This model illustrates the relationship between systematic risk and expected return. This is commonly used to determine the performance of a portfolio and the cost of capital. In light of the recent growth and leadership of Korea's stock market, Pesonen (2017) asserts that actual evidence has been found to corroborate these theoretical implications. The CAPM will influence the relationship between macroeconomic indicators and SMP.

In contrast, Azeez et al. (2006) introduced the "Arbitrage Pricing Theory" The model predicts future returns based on the relationship between broad economic variables and performance. This hypothesis extends the CAPM, demonstrating that the market risk premium is the most significant independent variable. The CAPM and the APT assume that investors' expectations are similar, that markets are competitive, and that capital markets are frictionless. Elshqirat

(2019), on the other hand, presents a multifactor approach to clarifying asset prices using the APT.

2.2 Empirical Review

Stocks are traded on the stock exchange. Ordinary shares represent ownership in a firm. It supplies capital to a corporation. The stock market grows more institutionalized (Wakeford, 2006). Numerous organizations and individuals are investing significant sums of money in the stock market. The primary reason for investing in equities is to generate profits. Few studies demonstrate that macroeconomic measures such as the INF, industrial production index, IR, and foreign ER have a significant role in elucidating the SMP (Mohammed et al., 2020). According to D. Aurangzeb et al. (2012), stock price fluctuations are directly proportional to company performance, the movement of macroeconomic variables, and government actions. Therefore, investors must know the ideal time to decide whether these circumstances produce anything distinct. Multiple research studies demonstrate that stock market gains positively correlate with a nation's economic growth.

2.3 Gross Domestic Product and Stock Market Performance

Numerous studies on GDP and stock prices have been conducted. Few studies have found a correlation between the SM index and the GDP (Hassan et al., 2019). However, Hunjra et al. (2014) found no correlation between the Gross Domestic Product (GDP) and the Pakistan Stock Exchange Composite Index. According to Singh et al., there is a high link between Taiwan's Gross Domestic Product and stock market performance (2011). Through their research, Momani et al. (2012) found a statistically significant relationship between share price and national production. Moreover, Balagobei et al. (2022) suggest that an increase in nominal GDP has a detrimental impact on the expansion of the SMP in Jordan. Ademola (2014) found that when GDP growth rates rise, so do stock values. According to Prasanna et al. (2019), real GDP positively affects the ASPI (All Share Price Index) in emerging countries. Marques et al. (2013) revealed that the stock market's growth affects economic growth, whereas Kapaya (2020) identified a unidirectional relationship between SMP and GDP. From 2006 to 2015, Saxena et al. (2018) evaluated the influence on the BSE 500 manufacturing companies and found no association. Tiryaki et al. (2019) found a positive correlation between SMP and industrial production. Long term, Ceesay et al. (2021) discovered that industrial production in Iraq is positively correlated with the share price. Consequently, the following theory is put forward:

H_1: Gross domestic product positively influences stock market performance.

2.4 Inflation Rate and Stock Market Performance

As Cheng et al. (2012) observed in their study, inflation is a macroeconomic indicator that directly affects SMP. Similarly, Jatiningtyas et al. (2016) discovered that inflation has a minor impact on the Kenya Stock Exchange stock returns. Kyereboah-Coleman et al. (2008) demonstrate that inflation has a detrimental effect on the SMP. According to Pal et al. (2011), the relationship between inflation and market performance in India is inverse. Moreover, A. Aurangzeb et al. (2012) revealed that inflation harms SMP on the Ghana Stock Exchange. Ho et al. (2019) analyzed SMP in Malaysia and found that inflation has an inverse effect, while Lee et al. (2018) observed that inflation has an inverse effect in Korea. Few studies have shown a positive correlation between inflation and share price in Iraq (Chang et al., 2018). Few studies have demonstrated that INF does not correlate with market return (Lakmali et al., 2015). In addition, Megaravalli et al. (2018) found no long-term relationship between inflation and SMP in China, Japan, and India. Using the Granger causality test, they discovered that the inflation rate and SMP on the Japanese and Indian stock markets could not be predicted. Thus, the hypothesis is formulated as follows:

H_2: Inflation rate negatively influences stock market performance.

2.5 Oil prices and Stock Market Performance

Despite the universal agreement that fluctuations in the price of crude oil are crucial in understanding stock price fluctuations, economists cannot agree on the nature of the connection between the two. More specifically, there is no consensus in the literature about the impact of oil price shocks on asset markets, such as stock prices. According to studies by Kaul et al. (1990), oil price volatility negatively impacts stock prices. Since oil price shocks harm both output and employment growth, as demonstrated by Papapetrou (2001), they harm equities. Lin et al. (2014) discover a negative relationship between SMP and oil price. According to research by Kang et al. (2013) and Park et al. (2008), oil price shocks had a detrimental impact on stock prices in 13 developed markets. Henriques et al. (2008), however, Using a market-based methodology that accounts for diverse risk premiums, we find that variables other than oil price, interest rates, and exchange rate are the primary drivers of oil and gas stock market performance. He demonstrates further that the equity returns of oil and gas businesses have a strong positive correlation with oil prices. The findings reported by Gogineni (2008) support a variety of hypotheses. If oil price shocks indicate changes in consumer spending, for instance, the market will increase; otherwise, it will decline. In addition, there is no link between stock prices and oil prices; when one decreases, the other does not rise accordingly. In addition, Cong et al. (2008) determined that the 1973–1974 increase in oil prices was not the cause of the decline in USS stock prices that year. Studies on the influence of oil price shocks on SMP have produced contradicting results, despite the popular assumption that oil prices continue to be a major factor influencing the stock market, as stated in early conventional literature. Kilian et al. (2009) criticized all of these analyses due to the widespread belief in economics that oil price shocks are exogenous. However, research indicates that oil prices behave similarly to stock prices Kilian et al. (2009). The endogenous nature of oil price shocks requires economists to disaggregate them into their contributing structural components. By disassembling shocks into their parts By treating oil prices as exogenous variables in connection to other determinants of the route of the economy, we may more properly capture the relative significance of these differential shocks for the trajectory of asset values and correct the inadequacies in past studies. Lin et al. (2010) have demonstrated that the response of aggregate USS real stock returns to a rise in the price of crude oil can differ significantly based on whether the increase is driven by world oil-specific demand shocks or worldwide supply shocks in the crude oil market.

Consequently, this study aims to analyze the effect of oil-price changes on stock prices in a representative sample of Greater China, emphasizing the structural shocks that characterize these movements. In this analysis, we intend to respond to this position by assessing the impact of previous oil price rises on Greater China's stock market. The results indicated that fluctuating oil prices could affect inflation rates after disaggregating. This research revealed a strong correlation between oil prices and inflation rates. Based on the prior debate, the following study idea has been proposed:

H3: The oil prices have a positive impact on stock market performance.

2.6 Energy Consumption and Stock Prices

There is an undeniable association between energy use and the attainment of financial objectives (Çoban et al., 2013; Ozturk et al., 2013). In addition, Sadorsky (2011) examines three ways economic expansion may affect energy use. Initially, economic growth can affect energy consumption by making it easier and less expensive for individuals to borrow money to acquire large-ticket products such as "automobiles, houses, refrigerators, air conditioners, and washing machines." Second, higher financial development benefits businesses by making access to financial capital easier and less expensive. SMP is particularly attractive to businesses since it offers them an additional funding source and equity financing. Consequently, more SMP affects wealth, which influences consumer and business confidence.

The connection between energy use and economic growth is indisputable (Narayan et al., 2010; Pirlogea et al., 2012). Sadorsky (2011) examines three ways economic expansion may affect energy use. Economic expansion may affect energy consumption by making it easier and less expensive for individuals to borrow money to buy expensive products such as "automobiles, houses, refrigerators, air conditioners, and washing machines." Second, higher financial development benefits businesses by making access to financial capital easier and less expensive. SMP is particularly attractive to industries since it provides them with an additional source of financing and equity financing. Consequently, more SMP affects wealth, which influences consumer and business confidence. The following research hypothesis is formulated based on prior discussion;

H4: Energy consumption has a positive impact on stock market performance.

3. Methods

The research technique consists of the methods and procedures utilized to conduct the study. It emphasizes study design, methodology, sample, data source, and analysis methods. This study's data was collected from secondary data sources. ASPI data was gathered from CSE annual reports. At the same time, macroeconomic data was obtained from the Central Bank, the Securities and Exchange Commission (SEC) annual reports, and the Iraqi Department of Census and Statistics. The population of the study includes all CSE-listed firms from 2000 through 2021. Iraq is the major stock exchange that oversees the Iraqi stock market. The method for data analysis consists of both descriptive and inferential statistics. Descriptive statistics outline the characteristics of the study's variables. The components of inferential statistics are Pearson's correlation and multiple regression analysis. Examining the effect of specified macroeconomic variables on SMP using a multiple linear regression model.

Table 1. Measurement and data Sources

SR.no	Variables	Measurement	Sources
01	Inflation rate	Inflation (annual percentage change)	WDI
02	Oil Prices	Changes in oil prices (base year 200)	WDI
03	Energy Consumption	Energy consumption (Percentage of GDP)	WDI
4	Economic Growth	GDP growth (Annual GDP percentage growth)	WDI
5	All share price index	All share price index	WDI

4. Regression Model

$$ASPI = \beta_0 + \beta_1 GDP + \beta_2 INF + \beta_3 OP + \beta_4 EC + \varepsilon$$

Where:

ASPI-All Share Price Index which is used as the stock market price

GDP-economic growth

INF-inflation

OP-oil prices

EC-energy consumption

5. Data Analysis and Results

The results analyzed from both descriptive and inferential statistics are discussed below.

5.1 Descriptive Statistics

Table.2 predicted values show the descriptive analysis results. Table.3 predicated values show the mean and standard deviation values for each variable. The mean measures the average value. Nevertheless, the standard deviation indicates a significant variation from the mean. The following mean and standard deviation values for inflation (M=1.394, SD=0.725), EC (M=0.794, SD=0.085), EC (M=0.537, SD=0.312), GDP (M=1.525, SD=0.752), ASPI (M=0.887, SD=0.641) are predicted in Table.3 below.

Table 2. Descriptive Statistics

Variable	Mean	Std. Dev.	Min	Max
INF	1.394	0.725	0.167	1.653
OP	0.794	0.085	0.183	0.719
EC	0.537	0.312	0.372	0.822
GDP	1.525	0.752	0.979	4.314
ASPI	0.887	0.641	0.273	1.879

Note: INF-inflation, OP-oil prices, EC-energy consumption, GDP-Gross Domestic Product, ASPI-All share price index

5.2 Correlation Analysis

The link between autonomous and ward variables, OP, GDP, EC, and INF is depicted in Table 3. Thus, the OP strongly relates to GDP, EC, and INF. The results demonstrate a negative correlation between GDP and EC. Moreover, the findings indicate that OP and EC are inversely associated. All of these numbers are projected in Table 3, which follows.

Table 3. Correlation Matrix

Variables	INF	GDP	EC	OP
INF				
GDP	0.386			
EC	0.371	-0.629		
OP	0.565	0.415	-0.530	

Note: INF-inflation, GDP-gross domestic product; EC-energy consumption, OP-oil prices

6. Multicollinearity and Homoscedasticity

Multicollinearity is the relationship between two or more explanatory factors that are statistically significant. It refers to the steady addition of new variables that increase the collinearity of all explanatory variables to a "harmful" degree (Lauridsen et al., 2006). VIF is a statistical method used to detect multicollinearity. A multicollinearity risk exists if the VIF is greater than 10 (Hair et al., 2012). This study had no multicollinearity concern among macroeconomic variables, as all VIFs were less than 10. Table 4 shows no heteroscedasticity in the model (p>0.05), indicating that errors are distributed consistently across variables.

Table 3. Multicollinearity

Variables	VIF
GDP	1.129
INF	2.128
OP	5.252
EC	4.316

Note: INF-inflation, GDP-gross domestic product; EC-energy consumption, OP-oil prices

6.1 Unit Root Test

Frequently, economic and financial indicators display trends. This inquiry employs the Augmented Dickey-Fuller (ADF) test to assess whether or not the variables have a unit root. Because the probability values at each level are less than 0.05, the test results show that all variables are stable. Table.4 illustrates those three macroeconomic variables with these values, GDP, OP, EC, and INF, are stationary on level ground. The GDP, OP, INF, EC, and ASPI time series have a unit root and are non-stationary processes, whereas the initial difference in the time series is stationary.

Table 4. Augmented Dickey-Fuller (ADF) test for 2000- 2021

ADF	Level	T Values	P Values
INF	I (1)	-3.182	0.0008
OP	I (1)	-4.256	0.030
EC	I (1)	-6.299	0.010
GDP	I (1)	-5.673	0.016
ASPI	I (1)	-6.826	0.001

Note: INF-inflation, GDP-gross domestic product; EC-energy consumption, OP-oil prices

6.2 Multiple Regression Analysis

Using multiple regression analysis, the effect of macroeconomic variables on the Iraqi stock market price is investigated. The adjusted R-squared value is 0.91, indicating that the independent variables GDP, OP, INF, and EC explain 61.9% of the observed variance in ASPI. The remaining 39.1% of the variation is attributable to factors not accounted for by this model. In addition, the model is significant and better suited to this investigation (F = 53,289, p 0.01). Four macroeconomic determinants substantially impact the SMP, as shown in Table 6. According to the table, the GDP substantially positively affects SMP in Iraq, supporting the hypothesized hypothesis H1.

Consequently, this concept has been validated as accurate. Previous empirical research has been carried out by (Jayasundara et al., 2019; Oguntimilehin et al., 2014). In addition, the coefficient implies that oil prices harm Iraq's SMP. H2 asserts that OP has a beneficial effect on SMP. Consequently, this concept has been validated as accurate. A. Aurangzeb et al. (2012) found a negative correlation between OP and ASPI, as did Haq et al. (Jayasundara et al., 2019).

Table 6 demonstrates that the INF has negative and severe effects on SMP in Iraq. H3 asserts that IF negatively affects SMP. Therefore, this theory is sound. The outcomes contribute to the efforts of (Lakmali et al., 2015; Wickramasinghe et al., 2016). Table 6 illustrates that energy consumption (EC) has a beneficial impact on SMP in Iraq. H4 asserts that EC negatively affects SMP. Consequently, this concept has been validated as accurate. The revelation supports earlier findings by (Kamber et al., 2020; Shafana, 2014). According to Table 6, MS has a statistically significant favorable influence on SMP in Iraq (ß = 10073.43, p 0.05).

Table 3. Regression results

Variable	Beta	Standard Error	T Values	P Values
C	0.953117	0.286765	3.082638	0.0023
GDP	0.668805	0.136587	3.251655	0.0020
INF	-0.577786	0.172058	-3.448083	0.0006
OP	13.14365	4.069701	3.6720238	0.0030
EC	-2.056732	0.680923	-3.732468	0.0010

Note: INF-inflation, OP-oil prices, EC-energy consumption, GDP-Gross Domestic Product, ASPI-All share price index

7. Discussion and Future Directions

This study's objective is to examine the relationship between the macroeconomic variables oil price (OP), gross domestic product (GDP), inflation rate (INF), energy consumption (EC), and stock market performance (SMP) in Iraq. This analysis considered all of the companies listed on the Iraqi stock exchange. It is possible to conclude that four macroeconomic variables significantly impact SMP. GDP and oil prices greatly positively affect Iraq's SMP, whereas the other factors have considerable negative effects. According to these data, all four economic indicators are significant factors that could affect the stock market. In light of these data, it is clear that the Iraqi dinar has been steadily declining against the USS dollar, which will harm all share price indices (ASPI).

In addition to prior findings, this study has significantly contributed to the body of knowledge by considering the association of OP, GDP, INF, and EC on Iraq's SMP, which was previously disregarded. Consequently, the primary contribution of this work is to provide empirical support for the contention that the effects of OP, IR, EC, and GDP on stock prices are inconsistent. In addition, the data indicated a considerable and favourable impact of moving OP and GDP indicators on the Iraq stock market. Similarly, the study found that while oil prices are a reasonable alternative to stocks, they cannot be used as a hedge against inflation in Iraq due to the substantial impact of oil prices on stock prices. Therefore, the present study contributes to the existing body of knowledge. This study contributes to the existing body of knowledge by evaluating the relationship between macroeconomic variables and SMP in an emerging economy. It contributes to a greater comprehension of the influence of macroeconomic issues on developing markets, which have distinct institutions, structures, and organizations compared to developed markets. It has significant practical value since its econometric conclusions facilitate the implementation of appropriate regulatory, financial, and economic policies. The financial analysts, owners, and other stakeholders will use the study's findings to improve their decision-making. The research findings and subsequent policy recommendations may serve as a beneficial reference for policymakers to carefully manage the macroeconomic dynamics to improve the SMP of Iraq to formulate economic objectives and policies.

In addition to the important contribution, the recommendations are covered in this paper. Since GDP positively correlates with SMP, an economy seeking to expand its operations should concentrate on the manufacturing, industrial, and service sectors. Prudent management of macroeconomic and fiscal policies should prevent OP and OP volatility. The stability of these variables has a substantial impact on SMP. The government must establish strategies for mitigating the negative effects of macroeconomic variables with a negative impact. Future researchers will be encouraged to investigate the effects of macroeconomic concerns on SMP in several emerging economies, as opposed to focusing on a single market for comparative purposes.

Consequently, future studies could provide more information on the SMP and trends of several countries simultaneously, making it easier for policymakers, investors, and future academics to use as a resource. Future researchers will be urged to choose variables with higher frequency data to increase the precision of the results produced in the data analysis step. In addition, future researchers are encouraged to develop results by employing a wider range of data analysis techniques to establish a more comprehensive association between variables. Co-integration tests, Granger causality tests, and VECM tests, among others, can be used to enhance understanding of the variables. On the contrary. Along with the significant impact of macroeconomic indicators on stock prices, the findings still have consistent recommendations for investors and policymakers; therefore, future research could be conducted on other extended frameworks by increasing the number of variables that could increase the recommendations for investors and policymakers.

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