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Abstract:

The current study aims at investigating the impact of some macroeconomic variables on stock prices in Egypt by employing the cointegration methodology of the Engle and Granger model and the error correction model (ECM) during the period (from February 2008 to December 2021). The independent variables include expected inflation, exchange rate, overnight interest rate, and domestic liquidity. The results revealed that there is a long-term equilibrium relationship between the independent variables and the stock prices in Egypt (EGX100). In addition, the exchange rate and the interest rate have a significant negative impact on the stock market, while the inflation rate and domestic liquidity have a significant positive impact on stock prices in Egypt. The results also showed that the coefficient of cointegration is negative and stationary, indicating that the model is stable, and the monthly rate of adjustment in the event of a departure from the long-term equilibrium relationship among the model variables is 16.8%. This study recommends policymakers to pay attention to the prevailing rates of those selected independent variables because they have a significant impact on the stock market prices in Egypt.

Keywords: Macroeconomic variables, Stock prices, Engle and Granger cointegration test, Egypt

1.Introduction

The stock market is now considered a crucial component of the overall financial system because it stimulates the growth of all sectors of the economy by channeling savings from society's funds-surplus units to funds-deficit units and allowing for the most efficient allocation and utilization of scarce capital resources, thereby providing the foundation for long-term, sustainable economic growth (Gunawardhana and Mustafa, 2020).

Stock market performance can be considered a significant or good benchmark for assessing a country's financial power and development. As a result, an economy with a functioning stock market can frequently utilize its vital market index to evaluate changes in the economy's total output and economic activity (Adebayo et al., 2020). Attempts to forecast its performance have garnered significant interest from financial experts and are a major topic of financial research. Macroeconomic variables are one of the many elements that can indicate to stock market investors whether to expect a higher or lower return when investing in stocks (Talla, 2013).

Theoretical explanations of capital asset pricing include the present value model (PVM), the capital asset pricing model (CAPM), and the arbitrage pricing theory (APT). The PVM links the value of an asset to its future income or cash flows. Thus, it is a broad model for expressing the value of a share of stock as the present value of its future dividends (Yeong et al, 2010). Consequently, this model is concerned with determining the fair value of the financial asset by discounting those cash flows at a discount rate consistent with the degree of risk associated with this investment (Mishkin, 2013).

The CAPM, introduced by Sharpe (1964) and Lintner (1965), is an extension to the suggestions of mean-variance optimization of the model proposed by Markowitz (1959), where the expected return of a given asset is a linear function of its covariance with the return of the market portfolio. The CAPM assumes that investment risks depend mainly on their sensitivity to market risks which are considered systematic risks, while non-systematic risks (firm’s specific risks) can be eliminated in a well-diversified portfolio (Markowitz, 1952).

Sharpe (1964) and Lintner (1965) introduced the CAPM, but Ross (1976) developed an alternative asset pricing model using the arbitrage principle. The main difference between the two models is that unlike the CAPM, which depends on a single market risk factor which is systematic investment risk when estimating individual securities returns or portfolio returns, the APT includes several macroeconomic factors which provide risk premiums for investors to consider because the factors carry systematic risk that cannot be eliminated by diversifying. According to the APT, investors should diversify their portfolios but also select their own unique risk and return profile based on the premiums and sensitivities of the macroeconomic risk factors. Arbitrage will be used by risk-taking investors to take advantage of the discrepancies between the asset's predicted and actual returns (Nguyen et al., 2017).

According to the flow-oriented models introduced by Dornbush and Fisher (1980), increments in exchange rates influence international competitiveness, and the trade balance of the country, and thus, its real output. This would eventually be reflected in the firm's current and future cash flows and stock prices. Depreciation of exchange positively affects the competitiveness of domestically produced goods in international markets, and, thus, the stock prices of exporting firms increase (Muhammad and Rasheed, 2002). According to the stock-oriented approach proposed by Frankel (1983), an increase (reduction) in stock prices would result in significant capital inflows (outflows), causing exchange rates to appreciate (depreciate) due to increased (decreased) demand for domestic currency. As a result, the causality should run from stock prices to exchange rates (Fauziah et al., 2015; Parsva and Tang, 2017; Huang et al., 2021).

Results of Epaphra and Salema (2018), Norehan, and Ridzuan (2020), Islam et al., (2020), and Pole and Cavusoglu (2021)] approve this positive relationship. While the negative effect of exchange rate on stock prices was detected by [Khan and Khan (2018); Delgado et al (2018); Garnia et al, 2021]. As a country's currency appreciates, the exporters lose their competitiveness in the international market, which in turn decreases their sales, which eventually declines their stock price. Nevertheless, Omodero and Mlanga (2019) found that the exchange rate does not impact stock prices.

In terms of the inflation rate, Fisher (1930) contends that the stock market serves as an effective hedge against inflation because in the long run, inflation and the nominal interest rate should move in lockstep with predicted inflation. This means that increased inflation raises the nominal stock market return while keeping the real stock market return unchanged, completely compensating investors (Alshogeathri, 2011). In contrast, Fama (1981) believed that a rise in inflation rates negatively affected corporate profits and stock prices due to decreased real economic activity.

Eldomiaty et al (2018), Omodero and Mlanga (2019), Alam (2020), Alqahtani and Hakim (2021), and Garnia et al (2021) detect a negative relationship between inflation and stock prices because high and varying inflation rates create more uncertainty, and thus demand minimum return will also rise which will decrease the market valuation. However, other scholars [e.g., Kolapo et al, 2018, and Norehan and Ridzuan, 2020] find a positive relationship between inflation rate and stock prices. While (Epaphra and Salema, 2018; Fahlevi, 2019; Omodero, 2021) exerted that the inflation rate has no significant impact on stock market prices.

If the interest rate increases, bonds become more attractive and, thus, investors rebalance their portfolios through purchasing more bonds. Accordingly, demand for equities decreases, and their prices fall. Such a negative relationship has been confirmed by Fernando (2017), Kolapo et al (2018), Khan (2019), Nordin et al. (2020), and Garnia et al (2021). In contrast, other scholars (e.g., Mohamed et al., 2017; Dube, 2020) find that interest rate positively influences stock prices. The rationale of this positive relationship could be explained by the fact that investors compare the changes of interest rate with their expectations if these changes are more (less) than expectations, then it is considered bad (good) news to the stock market.

A wide range of studies covers the impact of money supply on the stock market, (e.g., Kolapo et al., 2018; Bohssan and Shaheen, 2021), which shows that they are inversely linked. In contrast, other scholars show, (e.g., Mohamed and Ahmed, 2018; Epaphra and Salema, 2018; Chiad and Sahraoui, 2021; Pole and Cavusoglu, 2021; Aliyu and Dodo, 2021), they are positively related.

The multiple impacts of the change of the money supply through these studies have been concluded in many ways. Since the expansion of the money supply is positively associated with inflation which would increase the nominal risk-free rate. This implies that increasing the risk-free rate would raise the discount rate which causes a decrease in stock price (Talla, 2013). The positive impact of money supply can be related to economic expansion due to a rise in corporate profitability and earnings and more stock return (Epaphra and Salema,2018).

Several academics have concentrated their empirical investigations on the relationship between stock market performance and macroeconomic variables, which has been thoroughly investigated in both developing and developed capital markets. Employing the Vector Auto Regression (VAR), and Granger causality test, Barakat et al (2016) investigated the relationship between the stock market and macroeconomic variables for the period from January 1998 to January 2014 for Egypt and Tunisia. Authors found that a causal relationship in Egypt between EGX 30 and consumer price index (CPI), exchange rate, money supply, and interest rate, additionally the same goes for Tunisia except for CPI. Results also showed that the selected macroeconomics are co-integrated with the stock market in both countries.

Ahmed and Ezzeddin (2017) investigate the relationship between Stock Prices and Exchange Rate in Egypt for the period 2003-January to 2015-December. Using Multivariate Cointegration and the vector error correction the authors concluded a bi-directional long-run causality and negative relationship between stock prices and EX.Using Multivariate cointegration and vector error correction models, Epaphra and Salema (2018) examined the relationship between stock prices and macroeconomic variables (Inflation rate, Treasury bill rate, exchange rate, and money supply) in Tanzania from January 2012 to

December 2016. The results showed that the money supply and exchange rate have a positive effect, but the ∓ treasury bill rate tends to have a negative effect on stock prices.

Suhartini and Widoatmodjo (2021) investigated the impact of interest rates, exchange rates, and money supply on the composite stock-price index in Indonesia Stock Exchange (IDX) during the period between January 2016 and December 2020. Applying a multiple-linear regression analysis, researchers found a positive but not significant influence of interest rates and exchange rates on JCI index while money supply has a positive and significant effect.

Utilizing the autoregressive distributed lag (ARDL, Kuntamalla and Maguluri (2022) investigated the short and long-run causal relationship between stock prices and macroeconomic variables namely inflation, money supply growth, interest rates, exchange rates and foreign institutional investments in India stock market from 2010 to 2020. Authors realized that macroeconomic variables have an insignificant impact on stock prices in the long run. In the short run, inflation and foreign portfolio investments have a positive influence on stock prices, but exchange rates have a negative impact on stock prices.

Many macroeconomic variables (such as inflation, currency rate, money supply, and interest rate) have an impact on stock market performance. Since 2008, the Egyptian economy has experienced numerous local and global events and shocks that have impacted both macroeconomic performance and stock prices. The most significant of these shocks include the global financial crisis that began in 2008, the political instability that Egypt experienced in 2011, the dramatic decrease in the value of the Egyptian pound versus the US dollar until it was floated in November 2016, and the outbreak of the COVID-19 pandemic. All these events were reflected in the general changes in the Egyptian economy and the performance of the stock market.

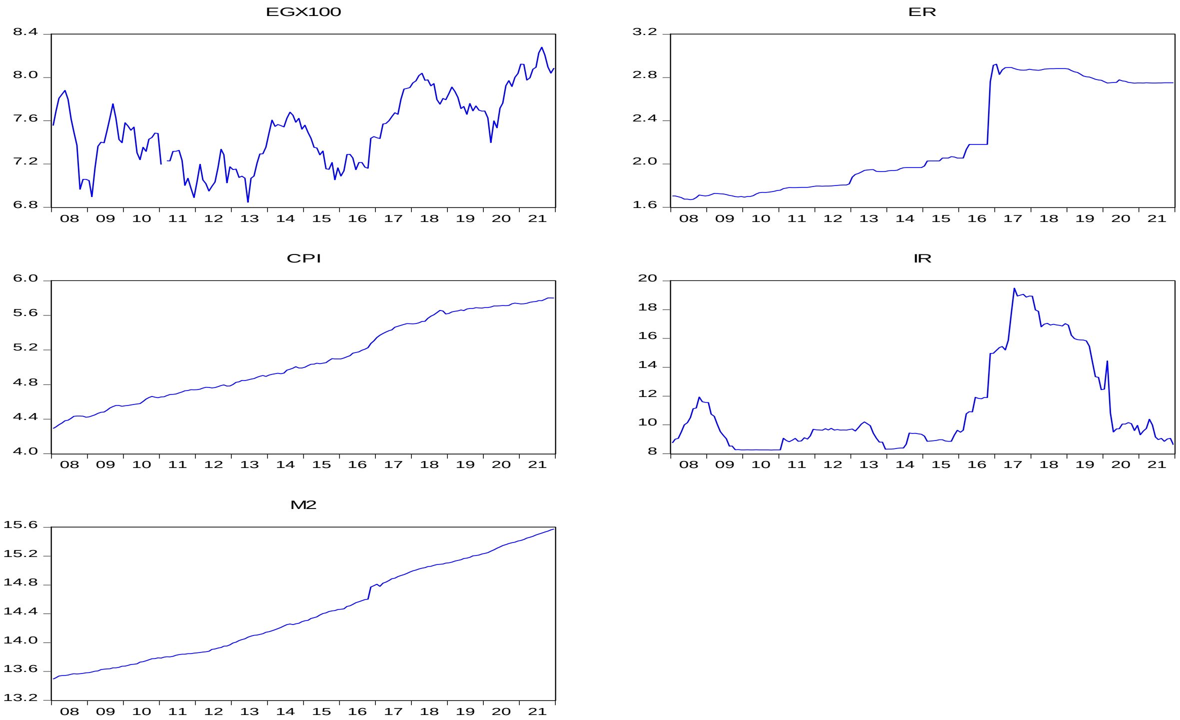
Thus, this study aims to examine the effect of macroeconomic variables namely, the domestic liquidity (M2), inflation (CPI), the Interbank Rate (IR), the nominal effective exchange rate (Ex), on stock market by studying the impact of those selected macroeconomic variables on EGX100 EWI from February 2008 to December 2021.

2-Methodology

2.1. Defining Data & Variables

The data are monthly frequency running from February 2008 to December 2021, making 168 observations in total for every variable. The data source of inflation and exchange rate was obtained from International Financial Statistics (IFS), the interbank rate and domestic liquidity from Central bank of Egypt, and EGX100 EWI was obtained from the website of the Egyptian exchange.

Figure (2-1): the graph of the variables of the study from the period (2008-2021)



*All variables with using logarithms except interest rate.

Source: Authors formulation depends on eviews-10.

2.2. The models of study

To address the problems arising from the effort to estimate long-term relationships between non-stationary series, the methodology of cointegration was developed. The concept of cointegration was introduced by Granger (1981) and mainly developed further by Engle and Granger (1987) and Johansen (1988, 1991, 1995).

Cointegration is a technical assessment of long-term parameters or balance parameters in a relationship where the variables are non-stationary. If a long-run equilibrium relationship exists between a set of variables, those variables are said to be cointegrated. The reason we use cointegration analysis comes from the fact that the regression of non-stationary series on other series could lead to spurious regression (Phylaktis and Ravazzolo, 2005).

In order to test variables for cointegration for Engle-Granger, we estimate the regression via the ordinary least square method and then the residuals from the same regression are tested for the presence of a unit root. If the residuals do not have a unit root (i.e. the residuals are stationary), it means that the residuals are *I(0)* and that the variables from the time series are said to be cointegrated and have a long-run (equilibrium) relationship (Gupta et al, 2021).

The Engle-Granger method is based on two distinct steps. The main advantage of the Engle-Granger method is its simplicity. Nevertheless, it is important to add that this technic is only available for series which are integrated of order one *I(1)*. If the variables are co-integrated, then the next step is to discover the short-run relationship between these variables through Error Correction Model (ECM).

2.2.1 Unit root test

If the series is non-stationary and the first difference of the series is stationary, the series contains a unit root. In time-series analysis, unit root testing plays a pivotal role in the integrational properties of data series. The common types of unit root tests are the augmented Dickey-Fuller (1979) (ADF) unit root test, and Phillips-Perron (1988) (PP) unit root test (Glynn et al, 2007).

Engle and Granger (1987) advise to use the Augmented Dickey-Fuller (ADF) unit root test which specify the null hypothesis (H_0: $\emptyset$ =0) that the time series has a unit root and hence, the times series is non-stationary. (H_1: $\emptyset < 0$), that is, the time series is stationary (Gujarati and Porter, 2005).

The test is applied with drift as follows (1):

$$\Delta y_t = \beta_0 + \emptyset y_{t-1} + \sum_{i=1}^{\rho} \emptyset_i \Delta y_{t-i} + \varepsilon_t$$

Where Δ is the first difference operator where ($\Delta y_{t-1} = y_{t-1} - y_{t-2}$), ($\Delta y_{t-2} = y_{t-2} - y_{t-3}$), etc. y_t is the time series of the study; β_0 is the drift term, and ε_t is the white noise error term.

2.2.2 Engle- Granger test

The residual-based test of Engle-Granger is a two-step method including an OLS estimation of the specified cointegrating regression model, and a unit root test of the residuals saved from the first step. If the residuals are found to be stationary then the variables are cointegrated, the Error Correction Model can be applied to investigate the short- run relationship.

1) Cointegration regression model

As the main goal of the study is to investigate the impact of macroeconomic variables on stock market performance representing EGX100, after making sure that the variables to be tested for cointegration are *I*(1) by running ADF test, the following cointegrating regression model of the variables is illustrated as follows (2):

$$EGX100_t = C + \beta_1 LCPI_t + \beta_2 ER_t + \beta_3 IR_t + \beta_4 LM2_t + \beta_5 Covid-19 + u_t$$

Where:

C = the constant term, $\beta_1 : \beta_5$ = the cointegration parameters

u_t = error term

$EGX100_t$ = the logarithm of EGX index

$LCPI_t$ = the logarithm of consumer price index

$LM2_t$ = the logarithm of domestic liquidity

ER_t = Exchange rate

IR_t= Interest rate

Covid-19 = Dummy variable

2) Unit root test on residuals

Using the ADF test on the residuals to examine whether the residuals are stationary or not by the following equation (3):

$$\Delta\hat{u}_t = \gamma\hat{u}_{t-1}$$

Where Δ as usual donates the first difference operator; $\hat{u}_t$ is the residuals; $\hat{u}_{t-1}$ is the one period lagged value of the error term. If the residuals are found to be non-stationary by accept the null hypothesis ($H_0: \gamma = 0$), the variables are not considered to be cointegrated according to Engle-Granger. If the residuals are found to be stationary($H_1: \gamma < 0$), the variables are cointegrated, the Error Correction Model can be applied to investigate the short- run relationship.

3)Error Correction Model (ECM)

Error Correction Model first applied by Sargan 1984 and later promoted by Engle and Granger corrects for disequilibrium. Granted that the variables are cointegrated, the Error Correction Model can be applied to investigate the short-run relationship among these variables as shocks can move long-run relationship off track (Gujarati & Porter, 2005). The short-term relationship can be expressed as (4)

$$\Delta \boldsymbol{y_t} = \beta_6 + \beta_7 \Delta \boldsymbol{x_t} + \varphi\hat{u}_{t-1} + \varepsilon_t$$

Where ε_t is the white noise error term and $\hat{u}_{t-1}$ is the lagged value of the error term. β_6 is the constant term while β_7 is the impact of the short-run changes in $\boldsymbol{x_t}$ on the short-run changes in y_t .φ is the speed of adjusted coefficient and is supposed to be negative and the term $\varphi\hat{u}_{t-1}$also negative and, therefore, $\Delta \boldsymbol{y_t}$will be negative to restore the equilibrium. That is, if $\Delta \boldsymbol{y_t}$is above its equilibrium value, it will begin dropping in the next period to correct the equilibrium error, hence the name ECM. A large absolute value of φ is associated to a large value of $\Delta \boldsymbol{y_t}$. The absolute value of φ determines how quickly the equilibrium is restored (Gujarati & Porter, 2005).

2.3 Data and descriptive statistics

Table (2.1) Descriptive Statistics

	EGX100	EX	IR	CPI	M2
Mean	7.507792	2.215805	11.10422	5.083869	14.41708
Median	7.510540	1.982283	9.650500	5.005000	14.29608
Maximum	8.280622	2.923113	19.49500	5.800000	15.57727
Minimum	6.845933	1.669592	8.258000	4.290000	13.49353
Std. Dev.	0.337434	0.479947	3.192234	0.462417	0.648935
Skewness	0.162058	0.374885	1.250518	0.128880	0.257721
Kurtosis	2.105409	1.353848	3.164566	1.631841	1.643183
Jarque-Bera	6.299681	22.76747	43.97587	13.56810	14.74643
Probability	0.042859	0.000011	0.000000	0.001132	0.000628
Sum	1253.801	370.0395	1865.509	854.0900	2422.070
Sum Sq. Dev.	18.90102	38.23796	1701.790	35.70959	70.32640
Observations	167	168	168	168	168

Source: calculated by the researcher using EViews-10

Table (2) depicts the descriptive statistics for variables. The table shows the basic statistical features of the data under consideration including the mean, the minimum and maximum values, standard deviation, kurtosis, skewness, and the Jarque-Bera test for the data in their levels. For instance, the standard deviations indicate that EX, and IR are more volatile compared to the M2, LCPI, and EGX100.

2.4. Results of the empirical study

4.4.1 Augmented Dickey-Fuller (ADF

The study depends on time series data, thus the first step we must test for stationarity of the included variables or the unit root test by applying Augmented Dickey-Fuller (ADF).

Table (2-2) Results of unit root test (Augmented Dickey-Fuller (ADF)

	Level		*First-Difference*	
Series	t-Statistic	Prob.*	t-Statistic	Prob.*
EGX100	-1.391010	0.5857	-11.42673	0.0000***
ER	-0.984928	0.7581	-9.479476	0.0000***
IR	-1.125179	0.7054	-11.72880	0.0000***
CPI	-0.743182	0.8317	-9.262531	0.0000***
M2	1.933010	0.9998	-12.84128	0.0000***

Source: calculated by the researcher using EViews-10

The table shows that all variables are non-stationary in level, but they are stationary in first difference. Therefore, the study will utilize a cointegration approach to figure out the effect of macroeconomic variables on the performance of the stock market.

2.4.2 Results of Long- run relationship.

In order to estimate cointegration regression we have some steps as following: **Firstly,** estimating the long run relationship (**Cointegration regression)** for the effect of macroeconomic variables on the performance of the stock market (EGX100) which gives:

Table (2-3) Results of Cointegration regression of long run effect of the Macroeconomic variables and EGX100

Variable	Coefficient		t-Statistic	Prob.
C	-9.278055	8.891503	-1.043474	0.2983
EX	0.004022	0.037199	0.108128	0.9140
IR	-0.017088	0.015607	-1.094924	0.2752
CPI	-2.648026	0.457821	-5.783975	0.0000
M2	1.983998	0.359621	5.516915	0.0000
DEXR	0.560766	0.305114	1.837889	0.0680
COV19	-0.125419	0.161072	-0.778648	0.4374
R-squared	0.697334			
F-statistic	40.19155			
Prob(F-statistic)	0.000000			

Source: calculated by the researcher using EViews-10

Secondly, from the first step the residuals should be estimated and tested for stationery.

Table (2-4) unit root test for long run residuals

Null Hypothesis: ECT100 has a unit root				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-4.162450	0.0000
Test critical values:	1% level		-3.470179	
	5% level		-2.878937	
	10% level		-2.576124	

Source: calculated by the researcher using EViews-10

The outcomes show that estimated residuals for the long run relation are stationary in the level, thus there are long run relation between included variables and cointegration can be estimated based on the short run form of the variables.

2.4.3 Results of Error Correction Model (ECM)

The coefficient of cointegration term is negative and stationary which implies that the model is stable, and the speed of adjustment is 16.8% for each month in case of a deviation from the long-term equilibrium relationship among the model variables. In addition, Changes in Exchange rate has a negative significant effect on stock market, as positive changes in exchange rate usually bring instability in the Egyptian stock market which causes negative impact on the value of the index. Thus, changes in exchange rate with one unit decrease the index of the stock market with 0.059. This result is consistent with the previous empirical studies of Norehan, and Ridzuan (2020), and Islam et al., (2020), and Pole and Cavusoglu (2021).

Changes in interest rate have a negative significant effect on the value of the index as the value of the coefficient is -0.036 which implies positive changes in interest rate of 1% causing a decline in the index value of 0.036. This makes sense with the economic theory as increasing the interest rate encourages individuals to deposit money in banks and then decreases the demand on shares and decreases the index. For domestic liquidity (M2), changes in (M2) have a positive significant effect on EGX100 which indicates changes in M2 by 1% leads to raising the value of the index by 2.55% as the most significant variable influences EGX100.

Concerning, the Changes in the price level has positive and significant effect on stock market index that denotes changes in CPI 1% leads to raising the value of the index by 1.57%. This result is in line with Fisher (1930) which implies that higher inflation will increase the nominal stock market return while the real stock return remains unchanged fully compensating investors. This outcome is consistent with the previous empirical studies of Delgado et al (2018); Gunawardhana and Mustafa (2020); and Norehan, and Ridzuan (2020). Regarding Covid-19, DEXR (Dummy variables), and budget deficit as a percentage of GDP have a negative but not significant effect on EGX100.

Table (2-5) Results of Error Correction Model (ECM)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.041745	0.015574	-2.680396	0.0082***
D (EX (-1))	-0.059967	0.025324	-2.368050	0.0191**
D (IR (-1))	-0.036468	0.015501	-2.352619	0.0199****
D(LCPI)	1.574482	0.699933	2.249475	0.0259**
D(M2(-1))	2.555605	1.041874	2.452892	0.0153**
DEXR	0.003126	0.019065	0.163967	0.8700
COV19	0.002636	0.027222	0.096822	0.9230
ECT100(-1)	-0.155358	0.046494	-3.341475	0.0010***
R-squared	0.1672	Mean dependent var		0.003020
Adjusted R-squared	0.196370	S.D. dependent var		0.105506
S.E. of regression	0.094581	Akaike info criterion		-1.820021
Sum squared resid	1.386574	Schwarz criterion		-1.631781
Log likelihood	160.1517	Hannan-Quinn criter.		-1.743608
F-statistic	3.073647	Durbin-Watson stat		1.860982
Prob(F-statistic)	0.000002			

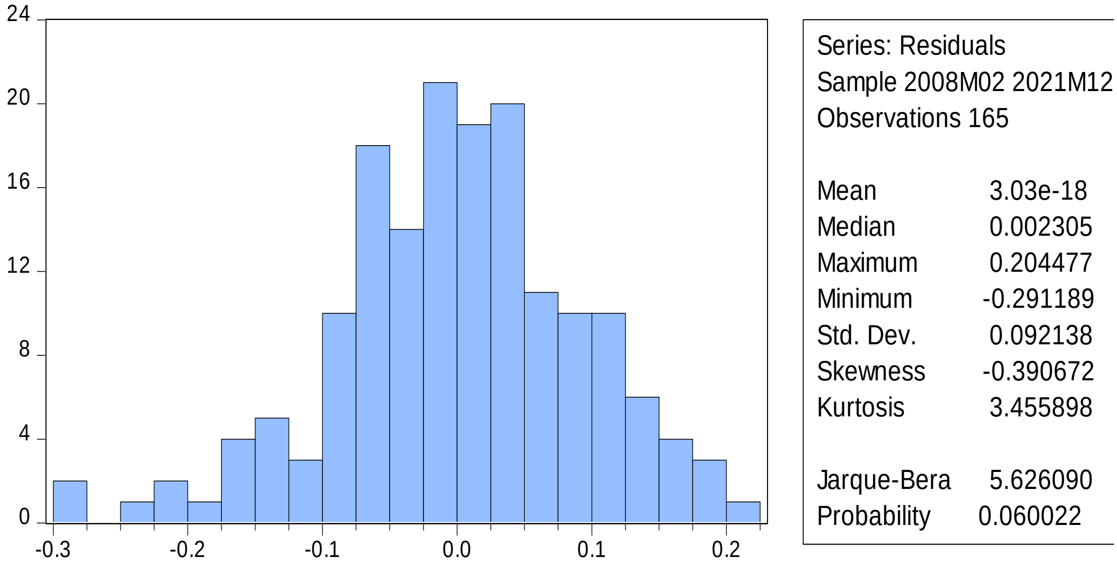
Source: calculated by the researcher using EViews-10

2.4.4 Diagnostic Tests

To examine the robustness of the estimated models, by conducting several diagnostic tests that investigate the stability and efficiency of the estimated coefficients, which are Jarque-Bera(JB) test for normality distribution, , Breusch-Godfrey Serial Correlation LM Test, Correlogram of residuals squared, and homoskedasticity Test.

2.4.4.1 Jarque-Bera (JB) test

Normality test



A hypothesis test formally tests if a population sample represents is normally distributed. The null hypothesis states that the population is normally distributed, against the alternative hypothesis that it is not normally distributed. Statistics show that with probability of 5%, we cannot reject the null hypothesis of the estimated residuals are normally distributed as P-value >0.05.

2.4.4.23 The Breusch–Godfrey test for autocorrelation

The Breusch–Godfrey test is a test for autocorrelation in the errors in a regression model. It makes use of the residuals from the model being considered in a regression analysis, and a test statistic is derived from these. The null hypothesis is that there is no serial correlation of any order up to p.

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.654155	Prob. F(2,154)	0.5213
Obs*R-squared	1.389953	Prob. Chi-Square(2)	0.4991

Source: calculated by the researcher using EViews-10

The table shows that we fail to reject the null hypothesis, as p-value> 0.05, thus there is no serial correlation that can be captured in the residuals.

2.4.4.3 Correlogram of residuals squared.

Table (2-6) Correlogram of residuals squared.

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
.|. |	.|. |	1	0.004	0.004	0.0024	0.961
.|. |	.|. |	2	0.012	0.012	0.0277	0.986
.|. |	.|. |	3	-0.050	-0.050	0.4472	0.930
.|* |	.|* |	4	0.133	0.134	3.4856	0.480
.|. |	.|. |	5	0.032	0.032	3.6657	0.598
.|* |	.|* |	6	0.114	0.110	5.9052	0.434
.|* |	.|* |	7	0.106	0.122	7.8642	0.345
.|* |	.|* |	8	0.127	0.118	10.695	0.220
.|* |	.|* |	9	0.085	0.098	11.979	0.214
.|. |	.|. |	10	0.065	0.059	12.741	0.239
.|. |	.|. |	11	0.018	0.004	12.800	0.307
.|. |	.|. |	12	0.069	0.037	13.666	0.323
.|. |	*|. |	13	-0.019	-0.067	13.733	0.393
.|* |	.|* |	14	0.137	0.085	17.177	0.247
.|* |	.|. |	15	0.092	0.055	18.745	0.226
.|* |	.|. |	16	0.083	0.030	20.016	0.219
.|. |	.|. |	17	-0.033	-0.042	20.219	0.263
.|. |	.|. |	18	0.010	-0.041	20.237	0.320
.|. |	.|. |	19	0.038	0.005	20.512	0.364
.|. |	.|. |	20	0.022	-0.034	20.601	0.421
.|. |	.|. |	21	0.073	0.040	21.624	0.421
.|* |	.|* |	22	0.165	0.139	26.898	0.215
.|. |	.|. |	23	0.008	-0.022	26.912	0.260
.|. |	.|. |	24	0.019	0.011	26.981	0.305
*|. |	*|. |	25	-0.070	-0.077	27.948	0.310
.|. |	.|. |	26	0.064	0.011	28.771	0.322
.|. |	.|. |	27	0.061	0.056	29.513	0.336
.|. |	.|. |	28	0.034	-0.027	29.741	0.376
.|* |	.|* |	29	0.174	0.175	35.854	0.178
.|* |	.|. |	30	0.078	0.039	37.105	0.174
.|. |	*|. |	31	-0.045	-0.076	37.525	0.195
.|. |	.|. |	32	-0.046	-0.029	37.964	0.216
*|. |	*|. |	33	-0.076	-0.152	39.156	0.213
.|. |	.|. |	34	0.040	-0.010	39.498	0.238
.|* |	.|* |	35	0.144	0.124	43.863	0.145
.|* |	.|. |	36	0.112	0.043	46.527	0.112

Source: calculated by the researcher using EViews-10

The correlogram shows that there is no auto correlation between the dependent variable and its lags.

2.4.4.4 Homoskedasticity Test

homoskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.757023	Prob. F(8,156)	0.0895
Obs*R-squared	13.63826	Prob. Chi-Square(8)	0.0917
Scaled explained SS	14.96996	Prob. Chi-Square(8)	0.0597

Source: calculated by the researcher using EViews-10

The Breusch–Pagan homoskedasticity test is based on distributed $n\chi 2$ with k degrees of freedom. If the test statistic has a p-value below 0.05, then the null hypothesis of homoskedasticity is rejected and heteroskedasticity assumed. The table shows that homoskedasticity cannot be rejected.

3.Conclusion

This study examined the long-term relationship between four macroeconomic variables (exchange rate, inflation, interest rate, and domestic liquidity) and EGX100. To achieve that, the ADF test has examined the series' stationarity and determined that all-time series are stationary. Using the Engle-Granger cointegration test, the long-term relationship between the variables and stock prices was determined. The results were found to be statistically significant and demonstrate their long-term cointegration. The coefficient of cointegration is negative and stationary, indicating that the model is stable, and the monthly rate of adjustment in the event of a deviation from the long-term equilibrium relationship among the model variables is 16.8%. Exchange rate and interest rate have a substantial negative impact on the stock market, whereas inflation rate and domestic liquidity have a substantial positive impact (EGX100 EWI). Thus, policymakers are expected to formulate policies to regulate the exchange rate and interest rate in the Egyptian economy, as any change in these variables results in instability on the Egyptian stock market, which has a negative effect on the index's value. In addition, the results imply that Egyptian policymakers must strategically promote policies that boost the growth of the money supply in a manner consistent with the country's rate of development.

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