The Influenc of International Trade Movement on Egyptian Stock index Flactuation

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Abstract:

Research Objective: The purpose of this study is to examine the effects of export, import, and foreign direct investment on the financial markets of Egypt fluctuations

Research Hypothesis: the research examine one the hypothesis of the study H_0: There is no statistically significant influence of international trade movement on Egyptian financial market flactuations.

Research Approaches: This study employs deductive methodologies during the period from 1999 to 2023, a statistical techniques were conducted utilizing annual data obtained from a EGX 30 index of the Egyptian Stock Exchange and data Extracted from world development indicators for Egypt import,export,foreign direct investment and inflation.

Results: The investigation uncovered the existence of cointegration. This implies a durable correlation between the variables, indicating that they have a tendency to co-vary over time despite temporary changes. This observation is particularly relevant to Egyptian firms that are registered in the Egyptian capital market. Three factors statistically significantly affect the Egyptian stock market: inflation, foreign direct investment, and exports of goods and services.

Keywords: International trade; EGX30; Foreign investment;Export;Import.

المستخلص:

هدف البحث: يهدف هذا البحث الى دراسة اثر التجارة الدولية متمثلة في الصادرات والواردات والاستثمار الأجنبي المباشر في تقلبات سوق المال المصري

فرض البحث: يقوم البحث على فرض رئيسي هو **H0**: لا يوجد تأثير ذو دلالة إحصائية لحركة التجارة الدولية على تقلبات سوق المال المصري.

منهج البحث: اعتمد البحث المنهج الاستنتاجي خلال الفترة من ١٩٩٩ إلى ٢٠٢٣، باستخدام تقنيات إحصائية بالاعتماد على البيانات السنوية التي تم الحصول عليها من مؤشر **EGX 30** للبورصة المصرية والبيانات المستخرجة من مؤشرات التنمية العالمية لواردات مصر وصادراتها والاستثمار الأجنبي المباشر والتضخم.

النتائج: كشف البحث عن وجود تكامل مشترك. وهذا يعني وجود ارتباط دائم بين المتغيرات، مما يشير إلى أنها تميل إلى التغير المشترك بمرور الوقت على الرغم من التغييرات المؤقتة. هذه الملاحظة ذات صلة خاصة بالشركات المصرية المسجلة في

سوق رأس المال المصري. هناك ثلاثة عوامل تؤثر بشكل كبير على سوق الأوراق المالية المصرية: التضخم والاستثمار الأجنبي المباشر وصادرات السلع والخدمات.

الكلمات المفتاحية: التجارة الدولية؛ مؤشر سوق المال المصري؛ الاستثمار الأجنبي؛ التصدير؛ الاستيراد.

1. **Introduction:**

The interplay between international business and financial markets holds immense significance in today's global economy. Trade between countries encompasses the interchange of products, services, and capital across different nations, playing a vital role in driving economic growth and fostering global integration. Financial markets serve as the primary mechanism for capital allocation, asset valuation, and risk management on a global scale. Understanding the intricate relationship between these two fundamental pillars of the modern economy is crucial for comprehending the complexities of our interconnected global society.

The impact of international trade on financial markets is multifaceted, involving various asset classes, regions, and trading platforms. Trade policies, supply chains, and regional challenges have substantial implications for financial markets, influencing stakeholders such as investors, businesses, and policymakers, and affecting numerous aspects including products, profits, and agreements.

International trade occurs when there is a demand or need for goods or services, leading to monetary transactions and the exchange of products and services between countries or regions. This type of the gross domestic product is largely composed of

trade (GDP) in most nations. In the previous several decades, the importance of international trade has grown, exerting influence on the economy, society, and politics. International trade involves more complex processes compared to domestic trade, as it is influenced by factors such as markets, legal systems, currencies, and government regulations. If a good or product is sold to a foreign market, it is deemed to be exported; on the other hand, an import is something that is purchased from a foreign market. Through international trade, wealthy nations may make the best use of their labour, capital, and technological resources. Different countries own a variety of natural resources and assets, such as land, labour, capital, technology, and more.

This enables some nations to manufacture the same commodity more quickly., cheaper, or more efficiently. Consequently, they might offer it for less than in other nations. Despite the fact that a nation is unable to create a certain good, it can still obtain it by trading with a nation that is able to make it. The concept of specialisation is frequently applied in the context of global trade.

The trading of different assets, including stocks, bonds, foreign exchange, and derivatives, occurs on the financial markets. For capitalist economies to operate efficiently, financial markets are essential. Financial markets are necessary for resource distribution and for giving businesses and entrepreneurs access to cash. This is essential to the smooth running of

capitalist economies. The markets make it easier for buyers and sellers to buy and sell financial assets by accelerating the process. Financial markets provide a range of assets that yield profits for investors and lenders with surplus capital, as well as providing a means for borrowers to get further funding.

This study seeks to quantify the correlation between the direction of international commerce and its impact on variations in the stock market in Egypt, as measured by the movements of the EGX30 index. This research will be segmented into numbered sections. (2) Research problem, (3) Research Objectives, (4) Research scope and limitation, (5) Literature Review, (6) Research Variables, (7) Results, (8) Conclusion

2. Research Problem:

Assessing a nation's economic prosperity and trajectory in the global economy heavily relies on the interplay between financial markets and international trade. Due to their substantial influence on one another, these two fields are interdependent and shape investment strategies, market dynamics, and economic policies. Owing to its advantageous geographic location, increasing trade activity, and evolving financial landscape, Egypt presents a compelling case study to examine the intricate link between global trade and financial markets. Providing an answer to the following query is the aim of this research: How much does the Egyptian stock index fluctuate in response to changes in global trade?

3. **Research objectives:**

evaluating and analysing the impact of global trade from 1999 to 2023 on the financial markets. Three sub-objectives can be derived from this study aim:

• To appreciate how international trade helps the financial markets.

• To comprehend the measurement process for the EGX 30 flactuation.

• To investigate the connection between changes in the financial markets and movements in international trade.

4. **Research scope and limitation:**

The study uses a quantitative methodology and is based on secondary data that was obtained from publicly available material on the World Bank and Egyptian Stock Exchange websites. The Egyptian stock index (EGX30) data from 1999 to 2023 and the World Bank's export and import data for the same time period make up the study sample.

5. **literature reviews**

Drawing on previous studies, this study looks at how global trade affects financial markets from 2008 to 2024. Drawing on earlier research, the report includes components pertaining to global trade and financial markets.

Mallikarjunappa, T., et al (2024) knowledge obtained via formal education and training. The relationship between trade

volumes and stock returns that is interrelated the research integrates the daily price and volume information of four notable indexes along with the National Stock Exchange of India Limited (NSE)-listed Nifty Fifty index-linked companies between 2005 and 2022. The findings of this investigation demonstrate a cause-and-effect link.

The authors of the study are K., et al (2024). pursued academic endeavours or obtained knowledge via formal schooling. This article looks at the relationship between the degree of stock market interconnectedness and the degree of international trade participation among nations. As per the authors' theoretical framework, the degree of trade interaction dictates the degree to which stock returns are impacted by disparate economies. This theory is assessed by the use of both directed and system-wide evidence, which is based on data gathered from eleven major economies between 2000 and 2021. The authors build a trade network using an input-output model and the Connectivity Index to measure the degree of connectivity inside the stock market.

Fernando, I., et al. (2024) did a study to evaluate the degree of financial integration between the financial markets in the US and Latin America, with a focus on the influence of trade agreements on promoting integration. Between January1,1990, and December31,2019, the sample looked at key market indices and noteworthy industries. Regression-based methods, a smooth

transition model, and structural breaks are all included in the DCC multivariate GARCH model, which is used to compute financial integration. Based on the data, an inversely proportional association is suggested.

Abadiyah, F., & Endraswati, H. (2023) carried out a study to look at how financial institutions, markets, and development affect global trade in eight developing countries. As control variables, the study also looking at foreign direct investment, real gross domestic product, and foreign exchange reserves. The International Monetary Fund and the World Bank (IMF) publications covering the observation period from 2011 to 2020 are the primary source of data used in this research. Using the Eviews 10 programme, the study model uses the regression analysis method of panel data, more especially using the technique of Ordinary Least Square. The outputs show that financial development in the D-8 countries has a positive and significant influence on international trade. But in the D-8 countries, financial markets and financial institutions have a pronouncedly negative impact on foreign trade.

Kiani, Memoona, et al. (2023) used a quantitative study to look at the complex interaction between globalisation, international trade, and Pakistan's financial markets. examined data from 2018 to 2022 using regression analysis, correlation, and time-series analysis. The results indicate a direct correlation between increased trade and improved stock market performance,

and more capital inflow is correlated with a growing globalisation index. Rate of exchange volatility is a currency measure of a sensitivity to shifts in the world economy. The focus of sensitivity study is on how foreign direct investment (FDI) might affect stock market indices. These revelations highlight how crucial trade policy, international integration, and foreign direct investment (FDI) are in determining how Pakistan's financial market dynamics change over time in the context of a changing world economy.Ukangwa, Jane, et al. (2023) carried undertook a study to look at how the depreciation of exchange rates affects economic output growth. The value of the naira, the currency of Nigeria, has fluctuated in respect to other currencies due to recent events. This study's main goal is to empirically ascertain how exchange rate depreciation affected the volumes of imports and exports between 1987 and 2017. The influence of currency rate depreciation on international trade was thoroughly examined by the researchers using data and empirical analysis. The results suggest that the government's attempts to reduce the differences between the official and parallel markets are what lead to the instability of the exchange rate regime. Additionally, the foreign trade of Nigeria has been significantly impacted by the volatility in the exchange rate. The study's findings show that, in order to reduce the volatility of foreign exchange rates, strict fiscal and monetary policies should be

implemented successfully. Exchange rate policies should also be managed efficiently in order to preserve a strong financial sector.

In their study, Gong, et al. (2023) examined the influence of international commerce on a company's selection of technology in a model that considers an unlimited time frame. Banks participate in oligopolistic rivalry when it comes to supplying finance to the manufacturing sector. Manufacturing firms participate in oligopolistic competition and make decisions on technologies that have varying levels of fixed and marginal costs. The outputs propose that there is no association.

Lal, M., et al (2023), investigated and recorded The significance of understanding the complex relationship among rate of exchange volatility and global trade is examined in this essay. The existing literature does not currently contain a thorough and current review of this subject. By looking at publication and citation trends, recognising significant contributors, and summarising important subjects related to exchange rate fluctuations and international trade, the study attempts to alleviate the dearth of research in the field. This is accomplished by applying scientific mapping methodologies and performance analysis. The study shows that different industries, exporters, and geographical locations are impacted by currency rate volatility differently.

Mladenovski, Branko (2023) explored the history and current state of the global financial system, highlighting how it supports

finance, investment, and trade. The evolution of managed floats and the historical shift from fixed to floating exchange rates were both covered in the article. The method by which the system sets currency rates was the main focus of the analysis, which also emphasised the system's resilience to past crises like the COVID-19 pandemic and the 2008 recession by showing that financial market activity continued to expand. However, the research acknowledges the uncertainties surrounding the system's future brought about by shifting economic power relations and geopolitical tensions. Finally, the text suggests that in order to ensure stability going forward, reforms should be implemented inside a framework built on pre-existing norms. An immediate association is suggested by the results.

Wange, J. (2023). Publicly traded companies involved in import and export are found to be significantly impacted by the Sino-US trade war. While the dollar's rise attracts foreign investment, trade barriers reduce revenue. This study looks into the relationship between the USD/RMB the price of Tesla's stock and rate of exchange. It makes use of the ARMA-GARCH model to forecast volatility and stock returns. The results offer recommendations for the development and expansion of international publicly traded companies.

Coşkun, E. A. (2023) reviewed the COVID-19 period's use of feedback trading on the stock market. There are no significant differences found in this study across developed, emerging, frontier,

or standalone markets, nor between the high/upper middle and lower middle-income economies. Given that positive feedback traders have a significant influence on the majority of Asian stock markets during the initial phases of the COVID-19 epidemi, Asian stock markets are not very efficient throughout extended periods of time. In addition to highlighting the need for more attention to be paid to Asian stock markets, the study also shows how international investors affect market returns and volatility.

Guo, J., et al. (2023) undertook an analysis of the impact of several macro-characteristic events on China's stock markets, including trade friction. We have found that trade friction events have a significant impact on the stability of the stock market using a novel event analysis and quantile regression approach. Six trading days before to five trading days after the incident, this influence is visible. The results indicate a pronouncedly negative association.

Xiuping Ji, et al., (2022), tested for cointegration approach demonstrates a permanent equilibrium relationship between imports, exports, and sustainably growing economies. It also demonstrates how exports speed up increases in import capabilities over time and help GDP rise. Exports determine sustainable economic growth since a unidirectional causal connection exists among GDP and exports. Although GDP growth also propels import growth, the bidirectional causality between imports and GDP highlights the significant impact of imports on economic sustainability. There is a favourable association, according to the results.

Boer, L., et al (2022). employed a structural vector autoregression found via event day heteroskedasticity to examine the complex impacts of trade policy shocks on financial markets. They discovered that shocks resulting from restrictive US trade policies had a generally negative but diverse effect on US and foreign stock values. They lead to a decline in US interest rates, an raise in market uncertainty, and an raise in the value of the US dollar. The effects persisted for a few weeks or quarters. Trade policy uncertainty is the main driver of tariff level impacts, according to decomposed trade policy shocks. Shocks to US trade policy from China significantly damaged US markets. There is a negative association, according to the results. Chaliyan & Thomas (2021). examined whether, for the Indian economy, financial development and foreign commerce had a unidirectional or bidirectional causal link between them between 1980 and 2019. Three IMF-created measures of financial development—the financial market development index, the financial institutional development index, and a composite index of financial development—were used in the empirical analysis. Johansen cointegration, the vector error correction model, and the vector auto regressive model were used to look at the short- and long-term dynamics among the variables of interest. The econometric findings demonstrated that openness to trade and the composite financial development index do, in fact, have a long-term causal link. It is also discovered that there is cointegration

between the financial market development index and trade openness. Trade openness and the growth of financial institutions, however, do not appear to be correlated. Magda, Robert, et al. (2021) demonstrated that there is a rise in international commercial activity and a rise in regulatory measures that could operate as trade barriers. One such barrier is the volatility of exchange rates, which both directly and indirectly affects commercial activities. Rate of currency exchange volatility can have an impact on both trade agreements and a nation's trade balance. The research investigates the connection among devaluation and inflation and makes explicit how each affects the trade balance. The findings show that the trade balance in terms of imports and exports is greatly impacted by exchange rate volatility. In light of the findings, the exchange rate influences international trade as a non-trade barrier. Aliedan, M.M. (2021). determined that research was required to determine how trade openness and international commerce affected Saudi Arabia's sustainable development. The control variables in this study include inflation, real interest rates, foreign direct investment (FDI), and currency rates. The author uses secondary sources of information from 1986 to 2020, including World Development Indicators (WDI) and papers on sustainable development. The findings show that trade openness, inflation, FDI, interest rates, and exchange rates all positively and significantly correlate with Saudi Arabia's sustainable

growth.Kyriazis, Nikolaos A. (2021). reviewed the theoretical and empirical research on the trade policy uncertainty (TPU), a metric that is becoming more and more used in the fields of finance and economics. Additionally, using a range of Generalised Autoregressive Conditional Heteroskedasticity (GARCH) parameters, an empirical study was conducted to determine the effect that TPU has on the value of the Bitcoin market. Studies already conducted confirm that unclear trade policies result in more expensive and lower-quality goods as well as low levels of involvement in global commerce. Additionally, it resulted in decreased support for democracy, hesitant immigration inside the country, less socioeconomic mobility, and greater swings in profitable assets. Furthermore, our econometric results show that TPU has a positive correlation with Bitcoin prices, whilst crude oil prices have a negative correlation with this significant cryptocurrency. whereby it is discovered that more trade policy uncertainty boosts demand for and favours investments in riskier assets to help investors' portfolios balance the trade-off between risk and reward. This report served as a compass for investing in the midst of tariffs and trade conflicts. The findings show that the association is favourable. Leibovici, F. (2021). studied the effects of financial development on global trade with a multi-industry model that include enterprises that experience financial frictions and input-output connections. The findings indicate that trade shares move from labor-intensive to

capital-intensive industries as a result of financial expansion, with only modest overall effects.. El-Masry, A. A., & Badr, O. M. (2021). examined how Egypt's stock market performance is correlated with the foreign exchange market, concentrating on the period before and after the revolution on January 25. The Egyptian pound to US dollar exchange rate, stock market indices, and daily basis data are used. The data exhibits no long-term cointegration and is stationary at the first difference level, according to the findings. Foreign exchange and stock market indexes, as well as market capitalization, were significantly correlated before the January 25th revolution. Ibrahim Khalifa, (2020) examined how Financial Market Indicators (FMIs) were affected by the early adoption of International Standards on Auditing (ISAs) using the diffusion of innovation (DOI) theory as a framework. Design, technique, and strategy: Using panel data from 110 between 1995 and 2014, additionally Conclusions Three major findings are presented in this study. The first finding made by the authors is that the adoption of early ISAs has a detrimental impact on a number of financial market outcomes, including stock market integration, capitalization, turnover, return, and development as well as stock price volatility and trading volume. Second, by employing a different metric from the one suggested by DOI theory, the authors discovered that certain financial indicators have greatly improved since the adoption of ISAs, but only for listed companies that

simultaneously prepared their financial reports that fulfilled the requirements of the International Financial Reporting Standards and were subject to an ISA audit. Applications in practice Questions concerning the enforcement and implementation of ISAs are brought up by the empirical evidence. For instance, nations that embraced ISAs early on might have been primarily ruled by stock markets that had just opened. There is a favourable association, according to the results.Ruiz Estrada, Mario, et al. (2019) aimed to evaluate the impact of Brexit on Asian markets. This study's main goal is to evaluate and compare the short- and long-term trends and susceptibilities of the worldwide financial and trade markets, with a particular emphasis on Asia and Europe.Youssef M. and Mokni K. investigated in their 2019 study how stock markets in economies that rely significantly on oil are affected by shocks to the oil market. They found that, especially in nations that import oil, there is a dynamic relationship between the stock market and oil prices. Countries that depend on imported oil respond more strongly to changes in oil prices during unstable times. Regardless of how highly or poorly these markets correlate, the price of oil has a significant impact on their relationship.Rashid Latief and associates conducted a study in 2018 on The effects of variations in currency rates on international trade and foreign direct investment (FDI) in developing countries along the "One Belt and One Road" programme. Bangladesh, Bhutan, Nepal, India,

Pakistan, and Sri Lanka are the seven developing nations involved in the project. We gathered longitudinal data from the World Bank's World Development Indicators (WDI) database, the International Monetary Fund's International Financial Statistics (IFS) database, the U.S. Heritage Foundation, and other sources between 1995 and 2016. Using threshold-Generalized Autoregressive Conditional Heteroscedasticity (TGARCH) (1,1) and Generalised Autoregressive Conditional Heteroscedasticity (GARCH) (1,1), the exchange rate's volatility was calculated. models. Researchers Hungdah Su and Kuo-chun Yeh studied the Brexit decision on June 23, 2016, which led to the UK's withdrawal from the European Union (EU). The results of the national election shocked the world's financial markets and caused immediate turmoil. Owing to the UK's large and well-established banking sector as well as its function as a gateway to the EU for foreign trade and investment, many worries surfaced, which led to a catastrophic global recession. Japan is not an exception, based on the relationships it has with the UK and the EU as well as with Japan. The impact of Brexit on Japanese economic and corporate operations in the UK and the EU was examined in this study. An empirical investigation was conducted using the gravity model of international trade. Based on the economic sizes and distances between two entities, bilateral trade flows can be used, in accordance with this model, to investigate the factors impacting world trade. The impact of

Brexit on Japanese foreign trade, particularly with respect to the UK and EU, is demonstrated empirically in this article. The outcomes demonstrate a clear correlation.

Nguyen and Lam (2017) examined the Vietnamese stock market and five other comparable Asian nations from 2000 to 2015 using the measuring method created by Chaiporn et al. (2016). Fixed effect and random effect models were used in this study to assess the effects of financial development, financial integration, and international trade integration on the integration of national stock markets. The study found that the integrating securities market is not significantly impacted by international trade integration.In a 2016 study, Vithessonthi and Kumarasinghe examined how financial development and global trade integration affect stock market integration. making use of a dataset including 15 developed and developing Asian countries between 1985 and 2013. The results show that there is no relationship between a country's degree of stock market integration and its degree of integration with international trade.A study by Han, Qiheng, et al. (2015) examined how monetary policy and financial growth in two countries affected capital flows and international trade, as well as how they affected wellbeing and human behaviour. The study's conclusions suggest that differences in the degree of capital market development play a major impact in driving trade deficits and shaping international investment trends. Furthermore, research has demonstrated the

critical impact that monetary policies have in affecting investment, consumption, and trade balance. Moreover, nations with one-sided, pegged exchange rate policies typically have larger trade surpluses and buy more bonds. Gruber, D., and M. A. Castello (2015). knowledge obtained by formal schooling or conscious effort. The relationship between trade finance, the economy, and international trade is examined in this article. The body of literature now in existence does not offer a comprehensive understanding of how trade finance affects trade and the economy. The authors suggest a course of action that considers potential financial constraints that businesses may have in addition to the impact of outside funding on imports. This strategy is based on a global real business cycle model. Credit shocks cause trade and economic performance to shift, which has a big effect on the economy. Ma, Yue looked at how market incompleteness affected trade liberalization's benefits in his 2008 study. He tried to ascertain whether governments ought to liberalise the home goods market before deregulating international commerce, or whether they ought to free up trade internationally concurrently with domestic trade. The results showed that a consistent improvement in total welfare may be guaranteed by progressively opening the domestic products market before liberalising international commerce.

6. Research Variables

6.1 The Proposed Model

$\log EGX_{it} = \beta 0 + \beta 1\ \text{Exports}_{it} + \beta 2\ \text{Imports}_{it} + \beta 3\ \text{Foreign}_{it} + \beta 4\ \text{Inflation}_{it} + e_{it}$ (1)

Based on the former debates, the subsequent hypotheses can be formulated as follow:

H₀: There is no statistically significant influence of international trade movement and

Egyptian financial market flactuations.

Table (1) Research variable and abbreviations

Table (2) Descrptive statistics for the independent and dependent variables

	Exports of goods and services (annual % growth)	Imports of goods and services (annual % growth)	Foreign direct investment, net inflows (% of GDP	INFLATION__CONSUMER_PRIC	LOG_EGX_30
Mean	4.37665	76.61488	3.387851	9.678167	4.232471
Median	4.973599	77.75443	3.387499	9.469720	4.245412
Maximum	86.04330	134.2897	4.856954	29.50661	4.461865
Minimum	-23.65913	20.08658	2.130133	2.269757	3.964995
Std. Dev.	25.62139	39.43238	0.771400	5.960895	0.161535
Skewness	0.178791	-0.225824	0.089889	0.397922	-0.288291
Kurtosis	2.201487	1.680102	1.922288	1.963240	1.896127
Jarque-Bera	1.293504	2.027206	1.243524	1.28909	1.615606
Probability	0.026076	0.362909	0.536997	0.1176	0.445837
Sum	309.4163	1915.372	84.69627	241.9542	105.8118
Sum Sq. Dev.	15754.93	37317.90	14.28141	852.7745	0.626244
Observations	25	25	25	25	25

Source: based on EViews output

With reference to the earlier findings, it is evident that the data has a distribution of normal since average and median values are nearly equal, the skewness coefficient is nearly zero, and the Kurtosis coefficient is within the range of (-3 and 3).

A statistical test called the Jarque-Bera test is used to assess whether a particular dataset has a distribution of normal.. Testing for normality, the hypotheses is formulated: H_0:: Data is normal

Our findings from the preceding table were that all p-value> Alpha =0.05 then the null hypothesis is not rejected. The data follow distribution of normal.

6.2.serial correlation test

When a regression model's residuals show a pattern of correlation with one another, it is suspected that the assumption of independence between data has been broken. This is known as serial correlation. This may result in inaccurate results from hypothesis tests, wasteful standard errors, and biassed coefficient estimations.

6.2.1 Breusch-Godfrey test

The Breusch-Godfrey test, often known as the LM test for serial correlation, is a statistical test used to ascertain whether autocorrelation, or serial correlation, is present in a regression model. It is an expansion of the Durbin-Watson test, which is frequently employed in basic linear regression to identify autocorrelation. Regression models with several independent variables (multiple regression) or time series data are commonly subjected to test of Breusch-Godfrey. Its foundation is the idea of determining whether, up to a given lag order, the residuals of the model show serial correlation.

H$_0$: there is no serial correlation in the residuals up to the specified order.

Table (3) Breusch-Godfrey Serial Correlation LM Test

F-statistic	1.17095	Prob. F(2,18)	0.3532
Obs*R-squared	10.0131	Prob. Chi-Square(2)	0.2011

Source: based on EViews output

Since the p-value is higher than alpha (0.05), the null hypothesis—that there is no serial correlation in the residuals—is not rejected.

6.3.Testing for heteroskedasticity

Testing for heteroskedasticity in time series models is important to ensure that the assumption of constant variance of errors is not violated. When a model's error terms' variability varies across time, it is said to be heteroskedastic. Heteroskedasticity can result in inaccurate standard errors, biassed coefficient estimates, and invalid hypothesis test results.

6.3.1. White's Test:

White's test is a general test for heteroskedasticity in regression models, including time series models. It is often referred to as the White's heteroskedasticity-consistent covariance matrix test. Regressing the squared residuals from the initial model on the independent variables forms the basis of the test.

H$_0$:: there is no heteroskedasticity.

Table (4) Heteroskedasticity Test: White

F-statistic	0.80213	Prob. F(14,10)	0.657
Obs*R-squared	13.2241	Prob. Chi-Square(14)	0.509
Scaled explained SS	8.7885	Prob. Chi-Square(14)	0.844

Source: based on EViews output

When the p-value exceeds alpha (0.05), the null hypothesis—that there is no heteroskedasticity—is not rejected.

6.4.Testing for Multicollinearity for Model

When the predictor variables in a regression model show a high level of correlation with one another, this situation is referred to as multicollinearity. Regression analysis presents a number of difficulties. Multicollinearity makes it challenging to estimate the true influence of each predictor variable on the dependent variable. Unstable estimations arise from the coefficients' remarkable sensitivity to even small changes in the data. The capacity to distinguish and evaluate the unique effects of each predictor variable is hampered by multicollinearity. It is challenging to distinguish the distinct effects of the predictors on the outcome variable due to the high correlation across them. The standard errors of the regression coefficients rise with multicollinearity, reducing the estimates' accuracy. This tendency makes it more difficult to identify predictors with a significant impact and increases the likelihood of drawing incorrect conclusions. One popular method for determining whether a

regression model has multicollinearity is to utilise the Variance Inflation Factor (VIF). VIFs, or variance inflation factors, are used to quantify the degree of multicollinearity. A considerable correlation between the predictors is implied by high Variance Inflation Factor (VIF) values. It is challenging to comprehend predictor influence adequately when VIF values are quite high.How to interpret the VIF values: A VIF of 1 denotes no multicollinearity, which means there is no correlation between the predictor and the other predictors. Low to moderate multicollinearity is indicated by a VIF of 1–5, which is generally considered acceptable. Values above 10 are regarded as problematic, and a VIF above 5 implies a high degree of multicollinearity.

Table (5) Multicollinearity Test: Variance Inflation Factors

Variable	VIF	1/VIF
Exports of goods and services (annual % growth)	1.703581	0.5869
Imports of goods and services (annual % growth)	1.001044	0.99895
Foreign direct investment, net inflows (% of GDP)	1.862453	0.5369
Inflation, consumer prices (annual %)	1.327215	0.592

Source: based on EViews output

The study Models' variance inflation factor (VIF) values, as shown in Table (5), range from 1 to less than 5. This implies that there are no problems with multicollinearity in the residuals of the regression models.

7- Results

Using data during the period 1999 to 2023, an econometric model is fitted to estimate the impact of international trade on the Egyptian financial market. Table 6 presents the findings.

Table (6) Summary results for estimated least squares regression model for Egyptian financial market

Dependent Variable: LOG_EGX_30				
Method: Least Squares				
Sample: 1999 2023				
Included observations: 25				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
Exports of goods and services (annual % growth)	1.18248	0.083187	14.21	0
Foreign direct investment, net inflows (% of GDP)	1.1097	0.043125	25.73	0
Imports of goods and services (annual % growth)	-1.035129	0.049302	-21	0
Inflation, consumer prices (annual %)	-1.038957	0.0493206	-21.07	0
Constant	4.653134	0.133459	34.86556	0
R-squared	0.871411	Mean dependent var		4.232471
Adjusted R-squared	0.837571	S.D. dependent var		0.161535
F-statistic	25.75142	Durbin-Watson stat		0.998839
Prob(F-statistic)		0		

Source: based on EViews output

Based on the data in the previous table, it can be determined that the coefficient of determination is 0.8714. This indicates that the independent variables account for 87.14% of the total variation in the dependent variable, which is the volatility of the Egyptian stock market. The remaining percentage is attributed to random error or factors that were not included in the analysis. The model should have incorporated additional independent variables. The preceding table makes it evident that:Total correlation coefficient (R): The results showed a statistically significant relationship between the

independent variables and Egyptian stock market volatility at a 95% confidence level. The correlation value reached 0.933, which is a strong positive correlation, and therefore we can study the impact of the independent variables through a multiple linear regression model.

Evaluating the statistical significance of the adequacy of the regression model: The F test was employed to assess the significance of the variables in the model as a whole. The test yielded a value of 25.75142 at a 95% confidence level, indicating the high quality of the multiple regression model. Consequently, we may depend on the model's results and make predictions for future values with confidence.

The T-test was used to analyze the annual % growth of exports of goods and services. The beta coefficient for this indicator was found to be statistically significant in the multiple regression model, with a calculated T-test value of 14.21, which exceeds the threshold at a 95% confidence level. The table value of 1.96 indicates that the regression coefficient (Beta) for this variable, which is 14.21, is statistically significant and has a significant impact on EGX_30. The beta coefficient is 1.18248, indicating that a one-unit rise in the annual % growth of Egyptian exports of goods and services will result in a corresponding increase of 1.18248 in the volatility of the Egyptian stock market.

The T-test was used to determine the statistical significance of the beta coefficient for the indicator of Foreign direct investment, net inflows (% of GDP) in the multiple regression model. The

calculated T-test value was 25.73, which is greater than the threshold value. Therefore, at a 95% confidence level, the beta coefficient is considered statistically significant. The table value of 1.96 indicates that the regression coefficient (Beta) for this variable, which is 25.73, is statistically significant and has a significant impact on EGX_30. The beta value of 1.1097 indicates that a one-unit rise in Foreign direct investment, net inflows (% of GDP) will result in a corresponding increase of 1.1097 in Egyptian stock market volatility.

By conducting a T-test on the percentage increase in goods and services imports each year, it was determined that the beta coefficient for this indicator in the multiple regression model is statistically significant at a 95% confidence level. The calculated T-test value of -21 is smaller than the critical value. The table value of -1.96 indicates that the regression coefficient (Beta) for this variable, which is -21, is significantly different from zero and has a significant impact on Egyptian stock market volatility. The beta value of -1.035129 indicates that a one unit rise in the annual % growth of Imports of goods and services will result in a drop of 1.035129 in the volatility of the Egyptian stock market.

Concerning inflation, the T-test was used to determine the statistical significance of the beta coefficient for the indicator of inflation, measured as consumer prices (annual %), in a multiple regression model. The T-test value calculated was -21.07, which is smaller than the critical value. This indicates that the beta

coefficient is statistically significant at a 95% confidence level. The table value of -1.96 indicates that the regression coefficient (Beta) for this variable, which is -21.07, is significantly different from zero and has a significant impact on Egyptian stock market volatility. The beta value of -1.038957 indicates that a one-unit increase in Inflation, consumer prices (annual %) will result in a decrease of 1.038957 in Egyptian stock market volatility.

7.1.The Engle-Granger Cointegration Test

The Engle-Granger cointegration test is a technique employed to ascertain the presence of a durable connection between two or more non-stationary time series variables. Cointegration is a phrase used to describe the scenario in which two or more time series variables are not stationary on their own (meaning they have a unit root and show trends or random movements), but when coupled, they indicate a stable long-term connection. Put simply, they exhibit short-term changes yet nevertheless travel together over time. Initially, the stationarity of both the independent variables and the dependent variable is assessed to ascertain the stationarity of each variable at a specific lag difference.

7.1.1 Stationarity test for the dependent and independent variables

A unit root test, sometimes referred to as a unit root test for time series data, is a statistical test employed to ascertain the stationarity or non-stationarity of a time series dataset. Stationarity refers to the condition where the statistical characteristics of a time series, such as its mean, variance, and covariance, remain constant and do not vary over time. A time series has a unit root if it is non-stationary and the autoregressive coefficient (AR coefficient) is equal to 1. Unit root tests are mostly used to ascertain the stationarity of a time series. Non-stationarity can cause statistical analyses, such regression models, to produce inaccurate results. We employ unit root tests, such as the Augmented Dickey-Fuller (ADF) test. H_0: variable has a unit root (the series are not stationarity)

Table (7) Stationarity test for the dependent and independent variables

variables	Lag	Augmented Dickey-Fuller (ADF)	
		Sig	Test statistics
EXPORTS OF GOODS AND SER	1	0	117.857
FOREIGN DIRECT INVESTMEN	1	0.0009	68.4569
IMPORTS OF GOODS AND 01	1	0.0156	56.6457
INFLATION CONSUMER PRIC	1	0	85.7427
LOG EGX 30	1	0	33.154

Source: based on EViews output

Based on the data in the table, it can be concluded that the p-value (0.000) is less than the significance level of 0.05,

indicating that the null hypothesis should be rejected. The data exhibit stationarity after being differenced once. In other words, the series remains unchanged, allowing for the analysis of model variables and the study of their impact on the dependent variable.

7.2 Testing the Stationarity for residual

To test the stationarity of the residuals, the residuals are first estimated and the significance of the constant and trend of the residuals is tested. Based on the data in the table, it can be concluded that the p-value (0.000) is less than the significance level of 0.05, indicating that the null hypothesis should be rejected. The data exhibit stationarity after being differenced once. In other words, the series remains unchanged, allowing for the analysis of model variables and the study of their impact on the dependent variable.H_0: constant and trend are not significant

Table (8) Stationarity test for the dependent and independent variables

Dependent Variable: ET (residuals)				
Method: Least Squares				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.161891	0.033771	4.793705	0.0001
@TREND	-0.013491	0.002412	-5.592656	0
Log likelihood	26.62221	Hannan-Quinn criter.		-1.94273
F-statistic	31.2778	Durbin-Watson stat		0.92206
Prob(F-statistic)	0.000011			

Source: based on EViews output

When the p-value is smaller than alpha (0.05), the constant is statistically significant, and the null hypothesis is rejected. Statistical significance is also shown by the trend. H0: The residuals do not exhibit stationarity.

Table (9) Stationarity test for residuals variables

Null Hypothesis: D(ET,2) has a unit root				
Exogenous: Constant, Linear Trend				
Lag Length: 0 (Automatic - based on SIC, maxlag=5)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-7.178954	0.0000
Test critical values:	1% level		-4.440739	
	5% level		-3.632896	
	10% level		-3.254671	

Source: based on EViews output

When the p-value is less than alpha (0.05), the null hypothesis is rejected, indicating that the residuals are stationary at the second difference. As a result, when we compute the second difference, the residuals become stable. Cointegration is present since the residuals are determined to be stationary and the cointegration regression's coefficients are statistically significant. This implies that the variables have a long-term association, which means that despite occasional swings, they usually move in tandem over time. The dependent and independent variables are related throughout the long term. The dependent and independent variables have a cointegration relationship.

8- Conclusion and discussion

This study aims to examine the influence of international trade on the volatility of the Egyptian stock market using data from 1999 to 2023. After collecting the data, various statistical methods were employed to investigate the relationship. The statistical analysis's findings show that

1- A normal distribution is observed in the data.

2- The residuals exhibit no serial association. There is an absence of heteroskedasticity. And there is an absence of Multicollinearity among the predictor variables in a regression model.

3- The R-squared value is 0.8714. This indicates that the independent factors account for 87.14% of the overall variation in the dependent variable, which is the volatility of the Egyptian stock market.

4- The findings demonstrated a statistically significant correlation between the independent variables and the volatility of the Egyptian stock market, with a confidence level of 95%. The correlation coefficient attained a value of 0.933, indicating a robust positive correlation. Consequently, it is feasible to investigate the influence of the independent variables using a multiple linear regression model.

5- The annual % growth of exports of goods and services has been found to be statistically significant in the multiple regression model, with a 95% confidence level. This means that if the annual % growth of exports of goods and services

increases by one unit, the volatility of the Egyptian stock market will increase by 1.18248.

6- The statistical analysis of the multiple regression model confirms that there is a significant relationship between the Foreign direct investment, net inflows (% of GDP) and the Egyptian stock market volatility. This relationship is statistically significant at a 95% confidence level. Specifically, for every one unit increase in the Foreign direct investment, net inflows (% of GDP), the Egyptian stock market volatility is expected to increase by 1.1097 units.

7- The analysis of the multiple regression model shows that there is a statistically significant relationship between the annual % growth of imports of goods and services and the volatility of the Egyptian stock market. This relationship is significant at a 95% confidence level. Specifically, for every one unit increase in the annual % growth of imports of goods and services, the Egyptian stock market volatility is expected to decrease by 1.035129 units.

8- Concerning inflation, the consumer prices (annual %) exhibit statistical significance in the multiple regression model, with a 95% confidence level. This implies that a one-unit increase in inflation, consumer prices (annual %), will result in a decrease of 1.038957 in Egyptian stock market volatility.

9- The residuals exhibit stationarity at the second difference, indicating that they become stationary when subjected to the second difference operation. Additionally, the residuals are observed to be

stationary and the coefficients in the cointegration regression display statistical significance, implying the existence of cointegration. This suggests a persistent relationship between the variables over the long term, despite short-term fluctuations. Consequently, a long-run relationship is established between the dependent and independent variables, indicating the presence of a cointegration relationship.

To comprehensively analyze the impact of international trade movements on changes in the Egyptian stock index, a thorough analysis must consider multiple components and economic data. International commerce can exert both direct and indirect impacts on a nation's stock market, encompassing the stock index. One of the recommendations from our study is to prioritize exports across multiple sectors. Exports have a significant impact on the stock prices of these companies, which in turn contribute to the swings of the stock index. In order to achieve the required rates of economic growth, it would be beneficial for Egypt, like many other emerging countries, to decrease its imports by implementing trade barriers and boosting its exports. Hence, it is recommended that the Egyptian government formulate investment strategies that will streamline international trade and To attract greater foreign direct investment (FDI), it is imperative to enhance the range of financial instruments available in domestic financial markets.

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