Stagflation reflections on Egyptian stock market

انعكاسات الركود التضخمي على سوق الأسهم المصرية

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Abstract

This paper conducts a practical investigation into The relationship among inflation, economic growth, and stock valuation by analyzing performance metrics of the EGX100 index and its returns on the Egyptian Stock Exchange from 2006 to 2023. It seeks to ascertain whether stagflationary circumstances necessitate a shift in perspective among Egyptian investors. By examining whether macroeconomic conditions are genuinely compromised, it investigates alterations in return on investment and estimations of stocks during stagflationary intervals.

It is determined that the entire duration, which includes data from 2006 to 2023, indicates a direct connection between inflation and the market value of the Egyptian Stock Exchange index. Additionally, there is an adverse connection among inflation and yield earnings, which undermines investor confidence in the future path of monetary policy. The path analysis reveals stagflation occurrences in the quarters of 2017, 2018, 2022, and 2024. Consequently, the analysis suggests a negative correlation between stagflation and economic growth.

The paper highlights changes in the correlation between economic growth and inflation during stagflationary periods. It also identifies differing behaviors in earnings yield models and equity returns models between stagflationary and non-stagflationary periods. Consequently, the paper emphasizes the importance of employing a different approach when navigating the Egyptian stock market during stagflation.

Key Words: Stagflation, Stock Market, Egypt, Economic Growth, Path Analysis.

مستخلص

يتناول هذا البحث دراسة عملية للعلاقة بين التضخم والنمو الاقتصادي وتقييم الأسهم من خلال تحليل مقاييس أداء مؤشر EGX100 وعوائده في البورصة المصرية من عام ٢٠٠٦ إلى عام ٢٠٢٣. ويسعى إلى التأكد مما إذا كانت الظروف التضخمية تستلزم تحولاً في المنظور بين المستثمرين المصريين. ومن خلال فحص ما إذا كانت الظروف الاقتصادية الكلية معرضة للخطر حقًا، فإنه يحقق في التغيرات في العائد على الاستثمار وتقديرات الأسهم خلال فترات الركود التضخمي.

وقد تم تحديد أن المدة الكاملة، والتي تشمل البيانات من عام ٢٠٠٦ إلى عام ٢٠٢٣، تشير إلى وجود صلة مباشرة بين التضخم والقيمة السوقية لمؤشر البورصة المصرية. بالإضافة إلى ذلك، هناك علاقة عكسية بين التضخم وأرباح العائد، مما يقوض ثقة المستثمرين في المسار المستقبلي للسياسة النقدية. يكشف تحليل المسار عن حدوث الركود التضخمي في أرباع ٢٠١٧ و٢٠١٨ و٢٠٢٢ و٢٠٢٤. وبالتالي، يشير التحليل إلى وجود ارتباط سلبي بين الركود التضخمي والنمو الاقتصادي.

تسلط الورقة الضوء على التغيرات في الارتباط بين النمو الاقتصادي والتضخم خلال فترات الركود التضخمي. كما تحدد السلوكيات المختلفة في نماذج عائد الأرباح ونماذج عوائد الأسهم بين فترات الركود التضخمي وغير الركود التضخمي. وبالتالي، تؤكد الورقة على أهمية استخدام نهج مختلف عند التنقل في سوق الأسهم المصرية خلال فترة الركود التضخمي.

الكلمات المفتاحية: الركود التضخمي، سوق الأوراق المالية، مصر، النمو الاقتصادي، تحليل المسار.

1. Inflation target in Egyptian monetary policy:

Following the rapid currency devaluation and the resulting increase in inflation, the Central Bank of Egypt's (CBE) decision to raise the benchmark interest rate continues to be seen as unexpected, given that the country's economic growth remains below potential (Egypt, February 2024). According to Keynesian theory, increases in inflation are typically associated with higher economic growth due to demand-pull influences. However, market participants may find these forces confusing(Lopez, 2018).

Prior to 1970, the Keynesian hypothesis of a positive correlation between economic growth and inflation (AS-AD) had gained widespread support. In the following era, the term 'stagflation' emerged, challenging the legitimacy of this favorable relationship. Finally, the legitimacy of this connection was called into question (Eggoh & Khan, 2014).

Stagflation and its associated challenges were widely recognized in the 1960s, but it gained international recognition after the 1974-1975 recession[(Frisch, 1983), (Flemming, 1987)].

According to the latest research, the world experienced sporadic Recurrences of stagflation following the 2008/2009 financial crisis [(Colignatus, 2008),(Stiglitz, 2008)].

Stagflation presents a dilemma because using fiscal and monetary policies to stimulate low growth can exacerbate inflation, while employing tighter monetary policies to control high inflation can hinder economic growth (Nordhaus, 1988).

Achieving low and stable inflation is a prerequisite for achieving high, inclusive, and sustainable growth. The overview and mission of the Central Bank of Egypt entail ensuring price stability. Price stability was first stated as one of the Central Bank's primary objectives in Law No. 88 of 2003 and was recently reaffirmed in Law No. 194 of 2020. As a result, monetary policy has followed through on its mandate. In its June 2005 monetary policy statement, Egypt's Central Bank explicitly stated its intention to "formally establish an inflation targeting framework to strengthen monetary policy once the basic requirements are met." Achieving the inflation target rate is a condition for sound economic growth because it assists the central bank in maintaining price stability.(Egypt, June 2018)

Policy uncertainty poses a risk to equity investors in an already fragile macroeconomic environment. This is evident from an empirical analysis of the performance metrics of the EGX100 index and its returns on the Egyptian Stock Exchange from 2006 to 2023. This study examines whether macroeconomic conditions are truly affected and how market performance and stock valuations fluctuate during stagflationary periods.

2. Literature review

2.1. Introduction:

Keynesian economic theory suggests two factors driving inflation: cost-push inflation and demand-pull inflation. Demand-pull inflation, typically more common, occurs when there is an increase in the general price level due to excessive spending. On the other hand, cost-push inflation arises from rising production costs, which subsequently impact prices (Canepa, 2024).

The expansion of the economy is driven by the accumulation of tangible assets, such as business and government investments, as well as improvements in human capital. Consequently, Demand-pull inflation can be seen as a consequence of economic growth, indicating a positive correlation between growth and inflation. In contrast, the relationship between cost-push inflation and growth is more ambiguous, and the mutual impact of inflation on growth has been a topic of extensive debate [(Kuznets, 1980), (Senhadji, December 2001)].

Before the 1970s, the Keynesian aggregate supply-aggregate demand (AS-AD) framework, which posited a positive correlation between inflation and growth, was widely embraced (Eggoh & Khan, 2014). Subsequently, it became widely acknowledged that inflation has a detrimental effect on long-term economic growth[(Fischer, 1983), (Niken et al., 2023), (Ghossoub, 2023)].

Several studies have indicated that there is a positive correlation between growth and inflation at low inflation rates, but an adverse relationship occurs at elevated inflation rates [(Gylfason & Herbertsson, 2001), (Pollin & Andong, 2006),(Thanh, 2015)].

In Egypt, inflation remained below 5% until the early 1970s but rose sharply after the 1973 oil shock, reaching 13% annually until the mid-1980s. Subsequently, it surged to over 20% per year on average between 1986 and 1992. In the early 1990s, Egyptian authorities implemented a significant stabilization program, effectively reducing inflation to single-digit levels by 1994 and slightly above 6% by 1997 (Handy, 1998). According to (Rihan M.K. M.K., 2018), inflation has a negative impact on long-term growth; however, short-term growth above the trend requires an increase in inflation.

(Maher, 2023) sought to identify the optimal inflation rate threshold where inflation begins to impede economic growth. He emphasized that in the lower range, particularly at 9.32%, there is a significant positive relationship between inflation and GDP growth. However, once surpassing this level, inflation starts to negatively impact GDP growth, revealing an imbalance between both variables. Establishing a defined inflation level might aid central banks in establishing their inflation target beneath this critical level.

Stagflation, characterized by high inflation amid low growth, might be associated with this threshold level. However, it's important to note that while the threshold level suggests that high inflation leads to low economic growth, this isn't universally true. In a stagflationary scenario, inflation could escalate within an already sluggish economy. This is consistent with the observation that, akin to inflation, stagflation can stem from either demand or supply factors.

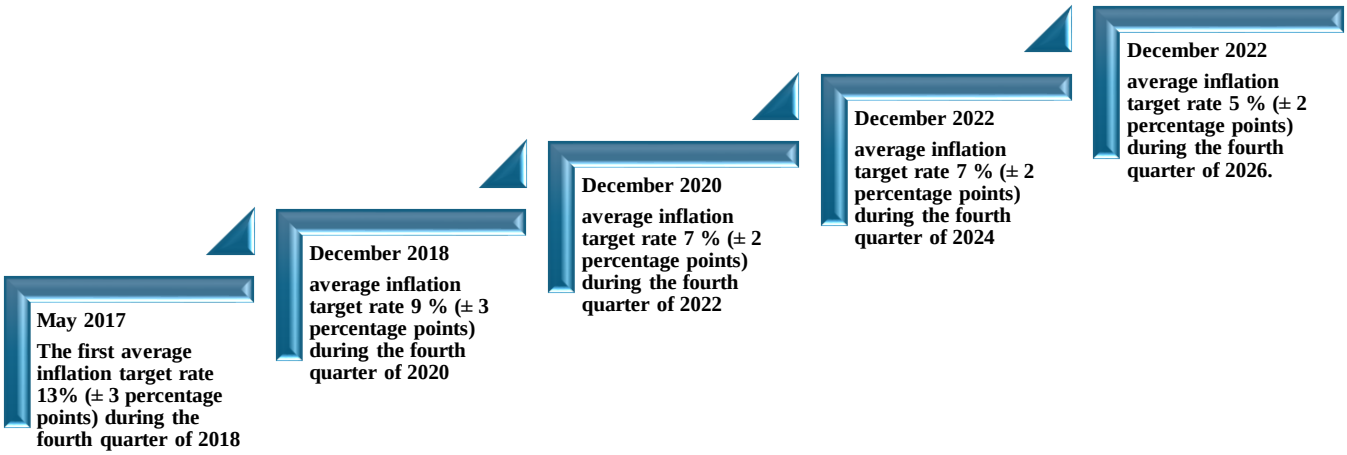
In Egypt, the prevailing economic conditions resemble stagflation, characterized by high inflation surpassing the CBE's inflation targets within a low-growth environment, below its potential growth rate. While this study does not conduct empirical analysis to understand the factors behind the existing economic circumstances, it is important to discuss the theoretical factors contributing to stagflation in the Egyptian context. The elevated inflation observed may stem from supply-side pressures, particularly in reaction to the recent devaluation of the Egyptian Pound, leading to a swift rise in the prices of imported goods, encompassing both finished goods and raw materials. Moreover, there have been controlled increases in prices for public services like electricity, water, and other utilities and goods.

When examining the effects of stagflation on the Egyptian Stock Market's performance and yield earnings, it's essential to understand how the stock market typically responds to low economic expansion and elevated inflation individually and concurrently.

2.2. Inflation Target Rates:

Inflation targeting (IT) is a monetary policy framework that involves the announcement of a numerical inflation target by Egypt's Central Bank. To transition to a flexible inflation targeting framework, the Central Bank has announced five inflation targets thus far, which reveled in figure 1:

Figure 1: Egyptian central bank inflation Target.



Source: Central Bank of Egypt, monetary policy sector, (May 2017 December 2020, December 2022), https://www.cbe.org.eg/

To further control inflation expectations, the Monetary Policy Committee decided to increase transparency about the downward inflation target path in its periodic statements and the quarterly series of monetary policy reports, which began in March 2017. To address the direct effects of supply shocks, headline inflation is expected to decrease to 13% (±3 percentage points) by the fourth quarter of 2018 and remain in single digits thereafter. The MPC believes that this target path is appropriate for reducing unwanted macroeconomic fluctuations. Achieving a low and stable inflation rate in the medium term boosts real income and maintains competitiveness gains, which is a challenge given Egypt's economic history.(Egypt, June 2018)

To maintain macroeconomic stability, the Central Bank aims to reduce general inflation to 9% (±3 percentage points) on average in Q4 2020, down from 13% (±3 percentage points) in Q4 2018. The inflation rate deviates from previously announced targets due to factors beyond the control of monetary policy.(egypt, 2020)

The Central Bank of Egypt has set a target inflation rate of 7% (±2 percentage points) for the fourth quarter of 2022, compared to 9% (±3 percentage points) in the fourth quarter of 2020, indicating continued support for economic stability. Monetary policy tools will be employed to manage expectations of inflation, alleviate inflationary pressures stemming from demand, and address the secondary impacts of supply disruptions, which could lead to deviations in inflation from desired levels. Such deviations may arise from factors outside the influence of monetary policy.(egypt, 2020)

The Monetary Policy Committee highlights that recent inflationary pressures stemming from increased demand are evident in the expansion of real economic activity compared to maximum production capacity, the uptick in prices of various consumer price index items, and the acceleration in domestic liquidity growth rates. The Committee has established a target inflation rate of 7% (±2 percentage points) on average during the fourth quarter of 2024 and 5% (±2 percentage points) on average for the coming period, confirming The dedication of the Central Bank to maintaining stable prices over the medium term.(egypt, 2022)

2.3. Determination of the inflation targets:

The inflation target rate is established to align actual inflation rates with the medium-term inflation rate while minimizing economic volatility. The medium-term inflation rate estimate signifies the ultimate inflation rate that the Central Bank of Egypt must strive to attain and sustain in line with the objective of price stability, ensuring that it does not undermine the competitiveness of Egyptian exports of goods and services.(Della Posta & Tamborini, 2023)

As a result, the Central Bank decided to establish several transitional inflation targets that will be met gradually until the economy achieves the target rate of inflation in the medium term, with no significant fluctuations in inflation or economic activity in the short term. This emphasizes the key difference between setting inflation targets that align with expectations and setting those goals in a way that ensures a smooth transition to the inflation rate in the medium term because the central bank has, within its capabilities, all the tools that can make the actual inflation converge to the target inflation rate in the medium term (except in cases where unforeseen factors occur). Specific externalities beyond the scope of monetary. (Mota & Fernandes, 2022)

Furthermore, the horizon for achieving the target rate is defined to correspond with the lag of the impact of real monetary conditions on inflation rates, also known as the "monetary policy horizon".

2.4. The Main Reasons for Inflation Deviating from The Target Rate:

A temporary deviation in inflation from the target level can occur due to the direct effects of some external shocks that are beyond the scope of monetary policy. In these cases, the Monetary Policy Committee is not required to respond to these temporary deviations and will accept the difference between the actual and stated target inflation rates (Canepa, 2024) . However, if these external shocks cause spillover effects that lead to overall price increases and have a long-term impact on medium-term inflation expectations, the Monetary Policy Committee of the Central Bank of Egypt can respond to avoid such situations. Examples of these external factors include:

1- Large deviations have a direct impact on global raw material, energy, and commodity prices.
2- The direct consequences of major changes in agricultural production and supply chains.
3- Natural disasters and other exceptional events have a direct impact on prices on the supply side.
4- Public finances and/or changes in administratively determined prices may be stronger or weaker than anticipated.

3. Research methodology:

This study aims to evaluate the relationship between inflation, economic growth, and the valuation of stocks, as well as their returns on the Egyptian Stock Exchange. It analyzes the performance data of the EGX100 index and its returns from 2006 to 2023. The study utilizes quarterly time series data for the research variables, divided into three periods: the first period includes stagflation, the second period excludes stagflation, and the third period includes stagflation only. High inflation periods are defined as those where inflation exceeds the target range of the Central Bank of Egypt.

Inflation and real economic growth rate data were collected from the Central Bank of Egypt, while data for the EGX100 index were sourced from Egyptian Stock Exchange reports. Regression analysis and multiple correlation were utilized to assess the proposed relationships. Path analysis was determined as the most suitable statistical method for this study, as it depends on cause-and-effect models. Path analysis aims to decompose correlation coefficients into direct and indirect effects.

To assess relationships among creatures, the Pearson correlation coefficient is utilized for the specimens listed below:

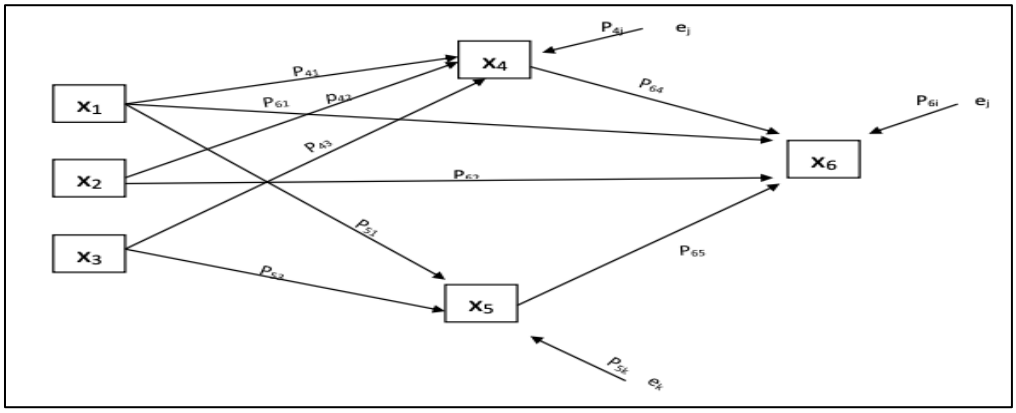
$$\textbf{Pearson's correlation coefficient} = \frac{cov\,(x,y)}{\sigma_x\,\sigma_y} \qquad (1)$$

Where cov(x,y) expresses the variance between data series X and data series Y, while $\sigma_x\ \sigma_y$ expresses the standard deviation of both, and we used t-test to establish the significance of the relationship:

$$t = r\sqrt{\frac{n-2}{1-r^2}} \qquad (2)$$

Here, 'r' represents the correlation coefficient, and 'n' represents the number of observations. To determine causal relationships, path analysis is conducted. This entails a series of linear equations expressing the relationships between relevant variables. The value of the path coefficient can be obtained from the output diagram as follows:"

Figure 2: Path diagram



Source: Created by the author through Smart-pls v4 output.

Path coefficients express linear relationships between two variables, symbolized by the symbol (p_{ij}), and written on the arrow emerging from the independent variable (j) to the dependent variable (i) as in the previous figure. The model equations can be deduced as follows.

$$X_4 = P_{41} X_1 + P_{42} X_2 + P_{43} X_3 + P_{4j} e_j \qquad \textbf{(3)}$$

4. Results and discussion:

The results of the goodness of fit of the models indicate that the Standardized Root Mean Square Residuals (SRMR) values for the models measuring the study periods are 0.043, 0.368, and 0.067, which are less than the value of 0.8, indicating a good fit. The Normed Fit Index (NFI) tests the descriptive significance of fit based on model comparisons and accepts the model when the NFI value is ≥ 0.95. In Table (1) , all NFI values exceed the acceptance condition of 0.95, indicating that the models are acceptable. Based on the results of examining the study models, we accept the estimated path analysis results for the study hypotheses models.

Table 1: Good Fit Test

test	Full period	Stagflation period	no stagflation period
SRMR	0.043	0.368	0.067
d_ULS	0.018	1.355	0.045
d_G	0.004	0.647	0.009
Chi-square	1.403	35.661	2.561
NFI	0.824	0.177	0.454

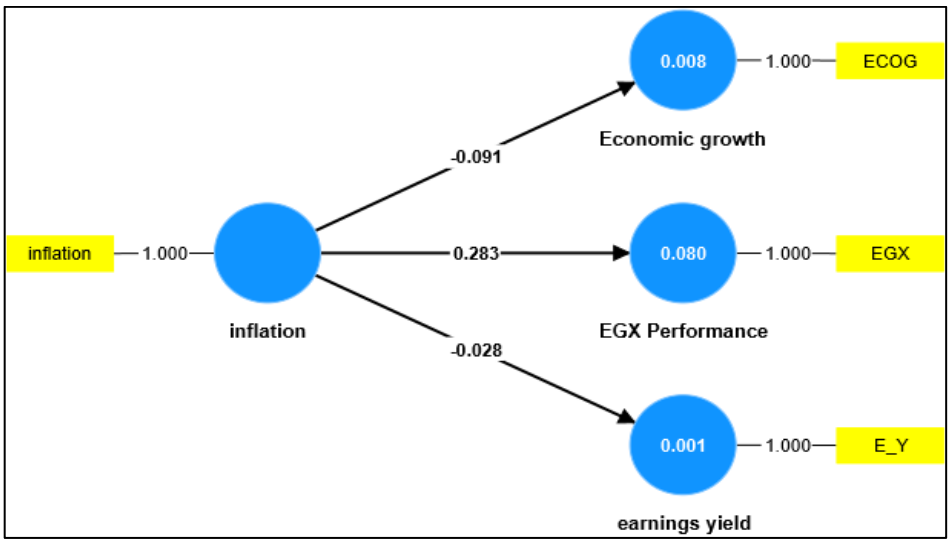
Source: Created by the author through Smart-pls v4 output.

4.1. Full period analysis

The full period includes data from 2006 to 2023, which is 18 quarterly years, so the number of observations becomes 72 observe (n=72), the result show there is a direct relationship of 0.283 between inflation and the index of the Egyptian Stock Exchange's performance. Inflation also explains 0.080 of the change in the Egyptian Stock Exchange's performance. The low rate of interpretation is due to the performance of the Egyptian Stock Index being governed by many variables, such as political and economic stability and the performance of the companies included in the index, which is consistent with previous studies. There is a negative relationship between inflation and economic growth, as inflation negatively affects economic growth in Egypt. Whenever inflation increases by 1%, this leads to a decrease in the economic growth rate in Egypt by a value of -0.091 during the period from 2006 to 2023.

Additionally, there is a negative relationship between inflation and yield earnings, indicating that an increase in inflation by 1% leads to a decrease in yield earnings by -0.028. The inflation rate of 0.01 also explains the change in yield earnings, and this relationship undermines investor confidence in the future path of monetary policy.

Figure 3: Path diagram full period



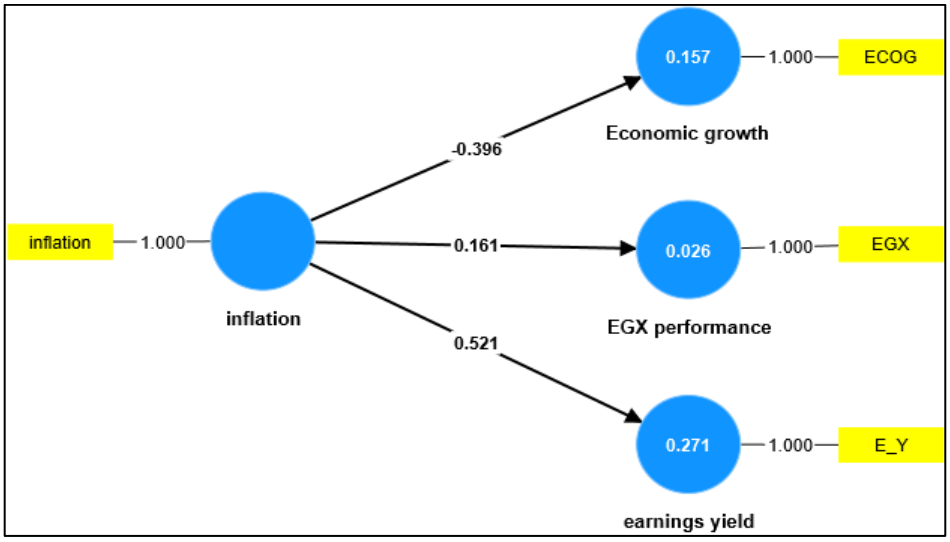
Source: Created by the author through Smart-pls v4 output.

4.2. Stagflation period analysis

The path analysis shows the period of stagflation, which occurred quarterly in the years 2017, 2018, 2022, and 2024. Therefore, the sample period will consist of 16 observations (n=16). These are the years when the actual inflation rate exceeded the inflation rate targeted by the Central Bank of Egypt. The analysis indicates an inverse relationship between stagflation and economic growth. This is supported by economic theories that suggest stagflation leads to a decline in economic growth, which is evident in Egypt.

While there is a direct relationship between stagflation and both the performance of the Egyptian Stock Exchange and yield earnings, the study indicates that one of the main reasons for this relationship is the rise in inflation in Egypt. This increase is attributed to factors such as a shortage in the supply of foreign currencies caused by global and regional crises, leading to price hikes due to a relative shortage in the supply of commodities. Companies are passing on the burden of high production costs to consumers. If companies absorb these high costs, their profits may decline. This is significant because a company's stock price and long-term earnings are closely tied to its earnings growth. Weak corporate earnings are more likely to affect its stock price outlook.

Figure 4: Path diagram stagflation period

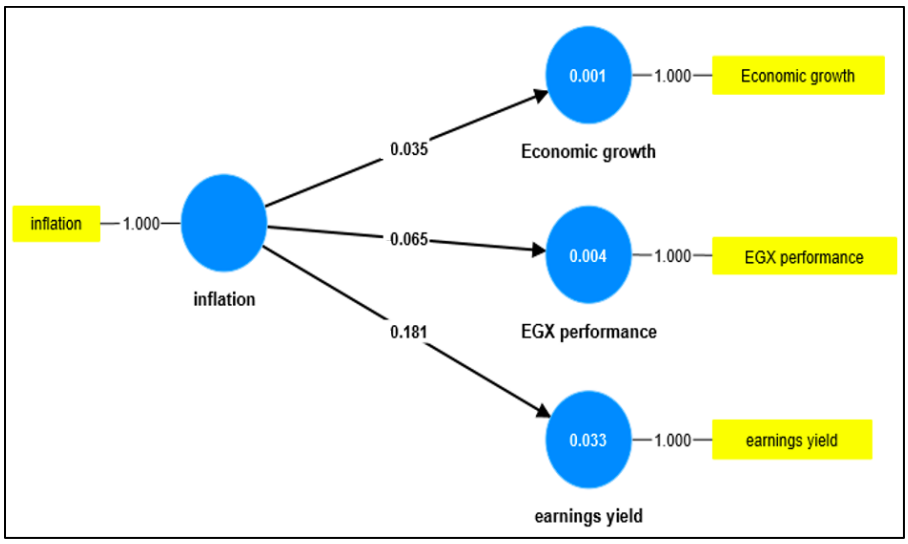


Source: Created by the author through Smart-pls v4 output.

4.3. No stagflation period analysis

During the period from 2006 to 2023, the periods of stagflation that were presented in the previous analysis were excluded, and thus the number of observations becomes (n=56). The results of the path analysis after excluding periods of inflation show that There exists a positive correlation between periods devoid of stagflation and economic growth, indicated by a positive value of 0.035. It is also positively associated with the performance of the Egyptian Stock Exchange and yield earnings. The current period generally exhibits a positive correlation between inflation and economic growth, as well as between the performance of the Egyptian Stock Market and yield earnings.

Figure 5: Path diagram No stagflation period



Source: Created by the author through Smart-pls v4 output.

4.4. Difference analysis

The following table indicates the results of path coefficients. It turns out that the variables during the three periods are statistically significant at a significant level of less than 5%. By comparing the data for the three periods, we find that inflation has a greater impact on the performance of the Egyptian Stock Exchange throughout the study period, and this effect is positive, while recession has a greater impact on the performance of the Egyptian Stock Exchange during the entire study period. Inflation has a negative impact on earnings yield at a greater rate than its impact on economic growth or the performance of the Egyptian Stock Exchange during the period of stagflation. During the period of no stagflation, we find that the most affected variable is earnings yield, and this effect is positive.

Table 2: Direction path analysis

Direction path analysis	Full period			stagflation period			no stagflation period		
	Path coefficients	T statistics	P values	Path coefficients	T statistics	P values	Path coefficients	T statistics	P values
inflation -> EGX Performance	0.283	2.485	0.013	0.161	2.687	0.049	0.065	3.656	0.012
inflation -> Economic growth	-0.091	2.772	0.04	-0.396	2.957	0.004	0.035	4.225	0.022
inflation -> earnings yield	-0.028	2.198	0.043	0.521	2.198	0.028	0.181	2.52	0.029

Source: Created by the author through Smart-pls v4 output.

5. Conclusion:

Ultimately, the study indicates that the stock market effectively mitigates the impact of inflation and incorporates future growth expectations into stock valuations. As inflation rises, the market becomes more affordable, while it becomes pricier as inflation decreases. This implies that investors may doubt the market's effectiveness as a reliable hedge against inflation. The adverse reaction in valuation to inflation might stem from the decline in the country's economic growth prospects rather than inflation alone. Our finding of a substantial adverse correlation between inflation and forthcoming economic growth bolsters this assertion.

The strength of these connections diminishes notably in stagflationary periods. The path analysis reveals stagflationary periods occurring quarterly in 2017, 2018, 2022, and 2024. These are the years in which the actual inflation rate surpassed the targeted inflation rate set by the Central Bank of Egypt. The analysis suggests a negative correlation between stagflation and economic growth. While there is a clear association between stagflation and the performance of the Egyptian Stock Exchange as well as yield earnings, the study highlights that the primary driver of this relationship is the escalation of inflation in Egypt. This surge is linked to various factors, including a shortage of foreign currencies resulting from global and regional crises, which, in turn, drives up prices due to a relative scarcity of commodities. Companies are passing on the burden of increased production costs to consumers. If companies absorb these costs, their profits may decrease. This is noteworthy because a company's stock price and long-term earnings are closely connected to its earnings growth. Subdued corporate earnings are likely to influence its stock price prospects.

Conversely, the relationships become stronger and sometimes change during non-stagflationary periods. The associations between inflation and real GDP growth, as well as between earnings yield and inflation, exhibit significant differences between stagflation and non-stagflation periods.

This research affirms that the Egyptian stock market exhibits distinctive behavior compared to conventional theory amidst stagflationary periods. Additional investigation is necessary to comprehend the underlying causes of these shifts and to devise suitable tactics for safeguarding assets and potentially leveraging evolving market dynamics during stagflation.

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