Analyzing the impact of inflation on the UK stock market: A focus on the FTSE 100 index

Ma, Nana

Kozminski University

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Author: Nana Ma
Institution: Kozminski University
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Abstract

This comprehensive investigation employed the Ordinary Least Squares and Newey-West standard errors to examine macroeconomic parameters, namely the relationship between inflation and the FTSE 100 index. The sample period was chosen from September 2018 to August 2023, at a period of significant inflation in the UK. The findings revealed a substantial and favourable association between the currency exchange rate and the FTSE 100 index. The impact of the oil price on the FTSE 100 index is minimal. The unemployment rate had a substantial inverse connection. The Consumer price index did not provide substantial predictive effects in terms of index movement and hence rejected the research premise.

Keywords: Consumer Price Index (CPI), FTSE 100 Index, Macroeconomic Factors.

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2 Introduction

2.1 Study Background

Typically, investors and politicians rely on stock market indexes' predictive indications to assess a nation's economic health. This area encompasses several aspects such as gross domestic product, consumer price index, interest rates, exchange rates, employment, balance of payments, and government fiscal and monetary policy. Moreover, these same indices have the capacity to function as a reliable indicator of the level of financial integration. Mukherjee and Naka (1995) contend that share prices tend to incorporate various predictors representing the value of corporate performance—their signals about upcoming boom or bust cycles. This highlights how the stock market is connected to the broader economy.

Focusing on specific factors, inflation and interest rates are crucial in affecting the stock market. Fisher's landmark study in 1930 made it clear that there is a strong link between what people expect from inflation and interest rates. Interest rates, often influenced by government policies, directly affect how much it costs to borrow money, impacting how companies perform and how their stocks are valued. Higher interest rates usually mean higher costs for future cash flows, reducing the value of stocks. Inflation, which can arise from factors like monetary policy and supply-demand imbalances, also directly impacts the stock market. Generally, higher inflation leads to lower stock prices because it reduces consumer spending (Christiano et al., 2010). It is also interesting to note how different types of stocks, like value stocks, might react differently during inflation. For instance, Bergen (2021) noted that value stocks might not increase in price as much as growth stocks during inflationary periods by researching whether inflation benefits the stock.

Over the past five years, the UK's inflation rate has seen notable fluctuations influenced by various economic factors. In recent times, specifically from 2019 to 2023, the inflation rate varied significantly, reflecting the economic challenges and changes in the UK. Starting in 2019, The inflation rate was quite mild, about 1.5%, but progressively increased. The inflation rate has risen for several reasons. Brexit played a role, as did global oil prices and trade dynamics. These three factors pretty much made the cost of things go up. However, the most substantial spike in inflation occurred during and after the COVID-19 pandemic, peaking at around 10.7% in late 2022. The pandemic caused disruptions in supply chains, labor shortages, and increased consumer demand as economies reopened, contributing to higher inflation. Global factors like rising energy costs also played a significant role in this inflationary surge.

By November 2023, the inflation rate had decreased to 3.9%, lower than the previous year's high but still above the long-term average of 2.83%. This decrease could be linked to stabilizing market conditions, government interventions, and adaptations in supply chains and consumer behavior following the initial impact of the pandemic (*UK-ONS, 2023*).

This study explores how macroeconomic factors such as interest rates, exchange rates, the Consumer Price Index, unemployment, oil prices, and industrial production affect the UK stock market, mainly focusing on how inflaion influences the FTSE 100 index.

2.2 Statement of the Problem

In the last several years, the global and local economies have faced a series of complex new challenges, including COVID-19, the Russia-Ukraine war, fiscal policy pressure, and economic and energy crises, et al. These lead to an instability of economic, and it reflected on the inflation. Many counties are suffering from the high inflation which never were happened in history. Knowing how inflation affected the stock market may be one way for an individual to profit from personal inflation hedging. Doing reasearch to analyse the correlation between inflation and stock market returns has always been a crucial subject of study.

In spite of the significant study that has been conducted on the effect of macroeconomic issues on stock markets, especially in light of the recent disruptions that have occurred in the economy, this is still a subject that needs to be investigated more. Over the course of a large time span that was distinguished by severe economic upheavals, the purpose of this research is to analyse the intricate link that exists between inflation and the performance of the stock market in the United Kingdom. Inflation might effect the price of products, borrowing cost, and cash flow liquidity, considering these reasons, study how the inflation impacted the stock return is seem to be crucial. This study adopts FTSE 100 index which represent the benchmark of UK economic. The study will also help investors and policymakers make more informed decisions in an inflationary environment and contribute to the existing knowledge on the interactions between macroeconomic factors and financial markets.

2.3 Purpose of the Study

Purpose:

Investigate the relationship and connection between some critical macroeconomic indicators and how they affect the UK stock market, specifically how inflation impacts the FTSE 100 index. This involves assessing whether changes in inflation have a discernible effect on stock market values. Check to see whether there is a connection between inflation and the FTSE 100 index that may be considered a causal link. Explore whether and how different sectors in the FTSE 100 respond to changes in inflation while recognizing that some sectors may be more sensitive to inflation than others. Analyse the outcomes of the correlation between inflation and the FTSE 100 index over various time intervals in selected sample periods, especially in recent times of change.

Question:

How do Consumer Price Index affect the FTSE 100 index performs?

Hypothesis:

H1: Inflation has a positive impact on the FTSE 100 index in the UK stock market.

2.4 Methodology

The FTSE 100 index and inflation relationship were analyzed using ordinary regression models in 5 years in a time series—the database from Bloomberg, a reliable source that maintains the integrity and accuracy of all information. StataMP 17 was adopted as a model-running tool. The dataset contains monthly information between September 2018 and August 2023. Before conducting the empirical study, data processing involved using logarithmic transformation and differencing to smooth out the data and eradicate fears of heteroscedasticity. Extreme values were also removed using the standard econometric practice since they might significantly influence regression results (Wooldridge, 2019).

In order to continue, it was necessary for us to verify that the data stayed in a fixed position. Employing unit root tests to ascertain the stationarity of the data is a crucial step in the study of time series. Assuming the potential multicollinearity, autocorrelation, heteroscedasticity, and Newey-West standard error adjustments by conducting a regression model (Wooldridge, 2019).

2.5 Outline of the study

This study structure starts with the introduction, which sets the stage for introducing the topic of inflation impacts on the FTSE 100 Index. It provides background and establishes the relevant study. The literature review presents research that has already been conducted and is pertinent to the topic of the link between inflation and the stock market. Additionally, it brings assist to the methodology and empirical results of previous articles. Data and methodology include the collection method and preparation. Explains the econometric models employed, and diagnoses check after that. Results and Discussion Present the findings from the empirical analysis by interpreting the results in the context of the research questions and hypotheses, discussing how inflation impacts the FTSE 100 Index. The last part, Conclusion, gives a summary of the key findings and their implications. It may also address the limitations of the study and the direction of future research.

2.6 Limitations

Research on the link between macroeconomic indicators, such as inflation, and the FTSE 100 Index, has many typical limitations: Periodicity, availability and accuracy of data. If the study relies on monthly or quarterly data, short-term fluctuations captured by daily or weekly data may be missed. Any econometric model, including OLS, can produce and lead to biased results (Wooldridge, 2019). The time period chosen for the study may limit the generalisability of the results. For example, if the study covers an unusual period of economic activity, such as the COVID-19 pandemic, the results may not be generalisable. Variables not involved in model selection may also have an impact on the results. While studies may show a correlation between inflation and the FTSE 100, proving direct causation is more complex and may not be conclusive. There are other indirect causes such as market dynamics, investor sentiment, market expectations and global economic trends. It is difficult for any econometric model to fully capture these complex dynamics. Acknowledging the limitations in the study is very necessary to understand the whole article objectively.

3 Literature Review

3.1 Introduction

The literature review for this study lists analyses of the impact of macroeconomic factors on the stock market in relevant academic works. This section begins by laying the theoretical foundations of stock market dynamics and provides an insight into how macroeconomic variables such as inflation, interest rates and exchange rates affect stock market performance.

3.2 Theoretical Framework

3.2.1 Efficient markets hypothesis

Fama (1970) established the foundation for the Efficient Markets Hypothesis (EMH), the definition of an efficient market is one in which stock prices fully absorb all of the information that is accessible with them. This definition implies that in such a market, predicting stock prices with certainty is not feasible to constantly achieve higher return then average market return.

Building upon this concept, Chan et al. (1997) suggested that global stock markets are weak-form effificient, it posits that all prior trading information has been reflected in stock prices within the framework of the efficient market hypothesis (EMH). As a result, it is impossible to sustain excess profits using technical analysis or prior price trends. However, the assumptions behind the Efficient Markets Hypothesis (EMH) have been challenged by different scholars. The study conducted by Lee et al. (2010) examined the stability of real stock prices in both developed and developing nations from January 1999 to May 2007. The research provides valuable insights on market efficiency. Their finding that the stock markets are not efficient contradicts the fundamental assumption of EMH.

When new macroeconomic data, such as inflation rates, GDP growth numbers, or changes in monetary policy, are revealed, the EMH proposes that the FTSE 100 index adjusts practically instantly. This reaction indicates the market's incorporation of the new information into the stock prices of the index's constituent companies.As we can see from historical statistics of the FTSE 100, it reached its lowest point when inflation was at its highest at 11% (*UK - ONS, 2023*).

3.2.2 The Fisher hypothesis

In Fisher's hypothesis, the focus is on the impact of inflation on interest rates and financial assets, positing that real interest rates remain stable over time while nominal rates fluctuate with expected inflation. A positive relationship between inflation and stock return has been continuously proven by Geske and Roll (1983). Boudoukh and Richardson (1993) extended this idea through a long-term study spanning over 180 years, examining the relationship between stock returns and both expected and realized inflation in the UK and US. They discovered a notable positive correlation between nominal stock returns and long-term inflation rates.

Further exploring this concept, Granville and Mallick (2004) analyzed UK data from 1900 to 2000, confirming the Fisher hypothesis by finding a significant long-term relationship between interest rates and inflation, with a positive coefficient indicating that interest rates rise more than proportionally with inflation increases. Hasan (2008), using empirical evidence in a linear regression model, reveals a positive and statistically significant association between stock returns and inflation, indicating that common stock is a useful inflation hedge.

According to Jaffe and Mandelker (1976), the first challenge of the Fisher effect, one of the earliest in this area, identified a significant negative correlation between inflation and US stock returns. This finding was echoed in subsequent studies by Fama and Schwert (1979) and Nelson (1975). Fama (1981) introduced the agency effect hypothesisto explain the negative correlation, he suggested that stems from a negative relationship between infaltion and real economic actitivty. Furthermore, Gultekin (1983), which analyzed long-term returns over 32 years, offered a contrasting perspective. He found a positive relationship between inflation and stock returns in the long term, challenging the previously observed short-term negative effects.

3.3 Macroeconomic variables and stock returns

Researchers expanded their studies to include a variety of macroeconomic factors and their impact on stock returns and began to investigate this relationship in different countries and under different market conditions. A direct relationship was seen between stock returns and some factors, such as real GNP, capital expenditures, lagged inflation, industrial production, and interest rates in US as the fisrt systematic study of Fama (1981) and (Roll & Ross, 1980). Their study was instrumental in laying the groundwork for subsequent research into the

intricate relationship between macroeconomic factors and stock market performance. Geske and Roll (1983) also found that industrial output, A proxy for economic activity, it has a positive effect on stock values by affecting projected future cash flows.

Chen et al. (1986) used the Arbitrage Pricing Theory (APT) model to demonstrate the presence of robust correlations between certain macroeconomic parameters and the performance of the US stock market. This study concludes that industrial output and fluctuations in the risk premium are particularly influential. Their research provided critical insights into how stock market volatility is intricately linked to the broader business cycle, underscoring the sensitivity of stock markets to economic fluctuations. Hamao (1988) find that these same factors explain the return for Japanese stock market.

In a follow-up study in 1990, Fama (1990) delved into a follow up studey the mechanics of stock market behaviour, implying that if stock prices properly represent anticipated future cash flows, then fluctuations in those values might serve as indicators of forthcoming macroeconomic circumstances. Using data on monthly, quarterly, and annual U.S. stock returns from 1953 to 1987. The relationship between the increase of industrial output and the returns on stocks was shown to have a substantial positive association. His findings suggest that stock market performance can be used as a leading indicator of certain aspects of economic growth. This insight opens up new avenues for economic forecasting and market research, highlighting the interconnectedness of the stock market and the economy as a whole. Building upon these foundations, Mukherjee and Naka (1995) further explored this relationship between the stock market and variables such as money supply, exchange rates, inflation, and industrial production in Japaness stock market, they indicated the existence of cointegrating and stock price contributed on this relation.

Cheung and Ng (1998) subsequently demonstrated a long-term connection between five natianal stock markets indexed and combined macroeconomic variables such as actual oil prices, actual consumption, actual money supply, and actual GNP production. Their examination of the relationship between stock markets and real GDP in different countries expanded the scope of this research area to a more global perspective. This research underscored the global applicability of these findings.

Hondroyiannis and Papapetrou (2001) conducted a study on the Greek stock market. They found that changes in stock returns were influenced by factors such as oil prices, industrial

production, and the Consumer Price Index (CPI). Oil prices had the double-edged effect of decreasing stock prices and damaging the economy; on the other hand, industrial production had a positive impact on the market. Rapach et al. (2005) performed an even more extensive study of twelve industrialized stock markets in nine countries. The team analyzed how macroeconomic factors like interest rates affected returns across these markets. One consistent finding from this extensive research was interest rates being great predictors of stock returns, proving how important monetary policy is to global stock dynamics. This international study also revealed how economic policies can have varying impacts on different country's markets. Ratanapakorn and Sharma (2007) built off this theme by looking at the U.S. stock market from 1975 to 1999. For example, Their study demonstrates that several factors such as industrial output, money supply, inflation, exchange rates, and short-term interest rates have led to a rise in stock values and a decrease in long-term interest rates. Their study provided a nuanced understanding of the variable effects of macroeconomic factors on stock prices over different time frames.

Hasan (2008) examined the correlation between stock returns and inflation in the UK by using several linear regression methods and vector error correcting models. Empirical evidence reveals a positive and statistically significant association between stock returns and inflation, implying that common stock is an effective inflation hedge. The findings of the unit root and cointegration tests show a long-run consistent link between price levels, share prices, and interest rates, which could be construed as long-run determinants of stock returns. The findings also point to a bidirectional relationship between stock returns and inflation. The evidence for a significant Fisher effect remains consistent across model parameters.

Humpe and Macmillan (2009) analysed the enduring correlation between macroeconomic parameters, such as industrial output, consumer price index, money supply, and long-term interest rates, by studying the U.S. and Japanese stock markets from 1965 to 2005. The authors of the study discovered that in the Japanese stock market, there is a positive correlation between industrial output and stock prices, whereas there is a negative correlation between money supply and stock prices. Furthermore, they discover that the consumer price index and long-term interest rates have a detrimental impact on industrial productivity.

Li et al. (2010) conducted a study using data from the UK to examine the correlation between inflation and stock returns in the short and medium term, as well as under different inflationary conditions. Empirical data suggests that in the near run, the UK stock market does not provide

protection against inflation. Nevertheless, the outcomes in the medium run exhibit a range of outcomes. The findings from several inflationary regimes indicate that the relationship between inflation and returns varies across different regimes.

In their study, Hsing and Hsieh (2012) find a positive correlation between Poland's stock market index and industrial output or real GDP, as determined by the GARCH or ARCH model. Conversely, they see a negative impact of government monetary policy on the German stock market index.

Jareno and Negrut (2015) conducted an examination to get a better understanding of this. His findings indicated that not only Unemployment and economic growth interacts with the stock market but various macroeconomic factors such as GDP and interest rates do as well.

Neifar et al. (2021) investigated the correlation between the UK stock market and macroeconomic variables (interest rates, consumer price index, and exchange rate) over the period of January 1999 to December 2007, prior to the occurrence of the 2008 Global Financial Crisis (GFC). The ARDL findings indicate that the logarithm of the consumer price index (CPI), interest rates (INT), and exchange rate (EXC) have a favourable influence on long-term UK stock values. Stock prices have a beneficial influence. The Toda and Yamamoto test indicates that only fluctuations in exchange rates reliably forecast or bring about alterations in UK stock values, and vice versa. There is a consistent and enduring association between macroeconomic indicators and stock market prices.

Agwu and Haydar (2023), The study currently incorporates ten years of data, the London Stock currency, interest rates, the consumer price index, and currency rates as macroeconomic factors. According to the regression results, the null significance hypothesis cannot be rejected in all three circumstances (interest rate, CPI, and exchange rate). As a result, these variables appear to have a considerable impact on the London stock exchange. The study then sought to explain which variables have the most impact on the London Stock Exchange. Agwu and Haydar (2023) revealed that interest rates were thought to have the greatest impact on the British economy. The Consumer Price Index (CPI) was also considered a critical variable. However, the study found that, while necessary, the CPI was less important than the interest rate. Exchange rates

These studies emphasise that the correlation between macroeconomic parameters and stock market performance might change greatly across various nations and economic conditions. They underline the need of examining country-specific economic factors when assessing stock

market behavior in connection to macroeconomic developments.

3.4 Inflation, interest rate and exchange rate on stock returns

Solnik and Solnik (1997) used multi-country panel data study to confirm the association between stock returns and inflation. The use of data from many countries tends to reduce the small-sample bias. Their findings validated the assumption that inflation had a considerable impact on stock market performance, which influenced later research in the subject. This research provides statistics that support the findings of Boudoukh and Richardson (1993).

Gjerde and Sættem (1999) indicated a significant shift in the geographical focus of this area of research, focusing especially on the Norwegian stock market. Because interest rates play such an important part in the VAR system, changes in this variable have an immediate and negative impact on stock returns. Stock returns explain only a small percentage of the change in inflation, whereas interest rates explain a substantial portion. Gjrde and Saettem (1999) demonstrate that the interaction between macroeconomic variables and stock market performance is not limited to large economies, but is also important in smaller, more specialised markets such as Norway.

Maysami and Koh (2000) identified a cointegration relationship between inflation, money supply growth, variations in short- and long-term interest rates, and fluctuations in exchange rates with changes in the levels of Singapore's stock market.

Khan and Rukh (2012) analyse the influence of interest rate, currency rate, and inflation on the stock returns of the KSE 100 index in Pakistan. The analysis includes a decade of monthly data, spanning from July 31st, 2001 to June 30th, 2010. The data is analysed using a multiple regression model, which reveals a tenuous correlation between the dependent and independent variables. The influence of interest rate and inflation on the stock returns of the KSE 100 index is negligible, however the exchange rate has a considerable effect on the stock returns of the KSE 100 index.

The study conducted by Jamaludin et al. (2017) examined the impact of macroeconomic factors, including inflation, money supply, and currency rate, on the returns of both conventional and Islamic stock markets in three ASEAN countries: Singapore, Malaysia, and Indonesia. Data was gathered on a monthly basis from January 2005 to December 2015. Utilising the panel least squares regression approach, the findings indicate that the exchange rate and inflation rate

have a significant influence on the returns of both stock markets, along with economic growth and inflation. The results of this article further establish that there is a stronger and negative correlation between the inflation rate and stock market performance.

Okechukwu et al. (2019) used GARCH methodologies to assess the presence of significant volatility in stock market returns and the influence of currency rates, interest rates, and inflation on stock market returns in Nigeria. They analysed monthly series data from 1995 to 2014. The study findings indicate that there is an inverse correlation between interest rates and stock market returns, however there is a positive correlation between inflation rates and exchange rates and stock market returns. In Nigeria, the stock market return volatility is highly influenced by the currency rate, interest rate, and inflation. This is the conclusion drawn from the analysis.

3.5 Developing country perspectives

The study by Phylaktis and Blake (1993) provides a counterintuitive view of stock returns in hyperinflationary compared to low inflation countries. This can be substantiated by the findings of their paper that stock markets in hyperinflationary countries react less rapidly to inflation changes raises awareness about complex and delayed nature through which returns on equities are influenced as a result of three distinct economies involving Argentina, Brazil; and Mexico. This is especially relevant in analyzing market activities when the economy is unstable.

In a study conducted by Choudhry (2001), the correlation between stock returns and inflation was examined in four Latin American nations with high inflation rates: Venezuela, Mexico, Argentina, and Chile. Current stock market returns are positively correlated with inflation, contrary to most prior research that has dealt with low inflation. The results show that stock returns are a good way to protect yourself against inflation. Findings also indicate that inflation rates in the past have an effect on stock returns in the present. We ran a parallel experiment using real stock returns. Real returns as of the present moment are inversely related to inflation rates as of the present moment and the lag period.

The complex link between Malaysian stock returns and macroeconomic factors is explored by Yusof and Majid (2007), particularly in the aftermath of the 1997 financial crisis. Their findings suggest that certain macroeconomic indicators such as the real effective exchange rate, money supply, industrial production index, and the federal funds rate are pivotal in stabilizing the

Malaysian stock market and attracting more capital flow into the country's economy. Intriguingly, the study also uncovers a significant direct influence of U.S. monetary policy changes on Malaysia's stock market. This demonstrates how alterations in the federal funds rate in the U.S. can ripple through and impact the Malaysian financial markets. It underscores the importance of government focus on these key macroeconomic variables to bolster market stability and foster economic growth in the face of global financial shifts.

Hosseini et al. (2011) investigated the association between China and India's stock market indices from January 1999 to January 2009 with four macroeconomic variables: crude oil price (COP), money supply (M2), industrial production (IP), and inflation rate (IR). The findings show that there are both long-run and short-run relationships between macroeconomic factors and stock market indices in both nations.

Naik (2013) evaluated the influence of macroeconomic conditions on stock market activity using Indian data. The research examined monthly data on five macroeconomic variables: the index of industrial output, inflation, money supply, short-term interest rate, exchange rate, and stock market index. The long-run equilibrium link between the stock market index and the aforementioned macroeconomic factors was investigated using Johansen's cointegration and vector error correction models. The research found that stock prices are favourably associated to money supply and industrial production, but adversely related to inflation. The value of a currency and interest rates on a short-term basis have little impact on stock values. Both the long and short term effects of macroeconomic circumstances on stock prices are accounted for by Granger causality.

Gay, Jr. (2011) used the Box-Jenkins ARIMA model to examine the temporal relationship between stock market index prices and macroeconomic parameters like as currency rates and oil prices in the BRIC countries (Brazil, Russia, India, and China). Although there was no substantial association between exchange rates and oil prices and BRIC stock market index prices, this might be attributed to the effect of other local and international macroeconomic variables on stock market returns. Furthermore, no significant association was identified between present and historical stock market returns, implying that the markets in Brazil, Russia, India, and China had low market efficiency.

3.6 Summary of literature review

The literature review of this study serves as a general theoretical and practical basis for the

analysis of how macroeconomic conditions affect the FTSE 100 in the UK. The paper starts with constructing a conceptual framework utilizing concepts like the Efficient Markets Hypothesis, Fisher Hypotheses, and inflation rate. The paper further delves into experimental studies that explore the impact of major macroeconomic variables on stock returns, particularly inflation, on UK market perspectives. These theoretical and pragmatic standpoints form the bedrock of this study's approach, thus ensuring that an investigation into the UK stock market is grounded in established economic theories alongside earlier findings. This all-encompassing approach guarantees a detailed analysis of the complex relationship between macroeconomic variables and stock returns.

4 Data and Methodology

4.1 Introduction

The section below describes the data that was used for empirical analysis. Data sources and periods are specified, and a table illustrating how the data was organized before executing some methods is provided. Second, the section deals with a description of research methodology concerning empirical analysis, where they describe an econometric framework including hypotheses.

4.2 Data sources and sample period

To study the inflation influences on stock returns, this work collected time series data for the FTSE 100 index and consumer index price and other control variables such as IP, UN, INT, EXC, and OP. The dataset covers 60 months from the Bloomberg database, from September 2018 to August 2023. The data comprises a total of 58 observations. The data was processed in StataMP 17. The sample range was selected due to a series of major events during the sample period. These include Brexit and Political Turmoil (2019–2020), the COVID-19 Pandemic (2020–2022), and the Russian-Ukrainian War (2022). Economic challenges and issues like inflation, unemployment, and the economic downturn were prominent, partly exacerbated by Brexit and the pandemic.

4.3 Definition of variables

In the pursuit of a comprehensive understanding of the factors influencing the FTSE 100 index, our study meticulously selects variables that are pivotal in the landscape of financial markets and macroeconomic indicators. The selection is grounded in both theoretical relevance and empirical significance, ensuring that each variable contributes meaningfully to the analysis.

Table 1-1 Notation of independent variable and dependent variables

Notation	Reference
FTSE	Clare and Thomas (1994)
CPI	Nasseh and Strauss (2000)
IP	Schwert (1990) , Fama (1990)
UN	Boyd (2005)
INT	Geske and Roll (1983), Cheung and Ng (1998)
EXC	Dornbusch and Fischer (1980), Bahmani-Oskooee and Saha (2016)
OP	Hondroyiannis and Papapetrou (2001), Gay, Jr. (2011)

Source: Compiled by author

4.3.1 FTSE 100 Index

The FTSE 100 Index will be analyzed as an index of a hundred companies constituting the largest British market capitalization. In January 1984, the FTSE was established to measure key sectors of Great Britain's economy; it has become an industry standard used by researchers in financial research. In their study on the relationship between stock returns and economic indicators for the UK market, Clare and Thomas (1994) and others explained this decision. Their research focused on the sensitivity to a range of economic indicators, which made the FTSE 100 index suitable for analysis along with macroeconomic factors and changes in stock market performance. The dependent variable, represents the percentage change in the stock market index, capturing the overall market sentiment and economic health. This variable is

central to the study as it reflects the cumulative effect of various economic forces.

As the movement of FTSE for last 60 month, it been in the bottom when the COVID-19 busted out, and it goes slowly up to normal standard in 2 years.

Source: https://www.londonstockexchange.com/indices/ftse-100

4.3.2 Consumer Price Index

The CPI, also known as the Harmonised Index of Consumer costs in Britain, monitors the fluctuations in costs of consumer goods and services, such as travel and food, over a period of time. It is regarded as one of the best measures for inflation. The relationship between inflation and stock market performance has been shown through research to be primarily influenced by either expected or unexpected inflation. In economics, if demand is greater than supply, then prices tend to rise. This leads to increased corporate revenues and retained earnings, translating into higher share values. This is an indication of the effect of expected inflation. However, unanticipated inflation lowers investments and forces resources toward consumption since the cost of living increases. Also, rates of interest increase, leading to a reduction in income. In their study, Nasseh and Strauss (2000) identified a correlation between stock prices and both local and foreign macroeconomic issues over an extended period of time in several European nations. Based on their research, stock prices are rooted in economic fundamentals such as the CPI. In general, the evidence suggests that inflation measured through the Consumer Price Index has relevant connections to stock market activity and returns.

4.3.3 Industrial Production

Industrial production (IP) as a key variable in this study is grounded in its significant role as a barometer of economic health and activity, directly influencing stock market performance. Industrial production is a vital gauge of economic robustness and efficiency as it quantifies the output of the industrial sector including manufacturing, mining, and utilities. Variations in industrial output might indicate shifts in economic circumstances, thus impacting business profits and investor assurance. The correlation between industrial output and stock market performance has been thoroughly examined in economic research. A research conducted by Schwert (1990) examined the influence of economic factors on stock returns and highlighted the stock market's susceptibility to fluctuations in economic activity, such as changes in industrial output. Additional investigation conducted by Farmer (1990) further supported this comprehension by asserting that stock markets have a tendency to react to a range of macroeconomic factors, such as industrial production, which indicates the present condition of the economy and its future potential.

4.3.4 Unemployment Rate

The unemployment rate reflects the overall growth and success of an economy. This metric is followed by investors as it can forecast future economic activity levels. Boyd (2005), established that stock markets react differently to jobless rate releases based on whether the economy is contracting or expanding. When there is economic growth, rising unemployment generally tends to have positive stock market effects, whereas it’s seen as bad news during recessions. Stock prices recover after an increase in unemployment, analysts observe.

Nevertheless, the impact of announcements about the unemployment rate on stock returns does not have a strict academic consensus. As monthly data is considered a significant driver, it often leads markets to change—the unemployment rate is an early indicator from statistical agencies. Commonly, job creation levels affect the economic outlook since employment tends to stimulate an economy. As consumer confidence is highly linked with employment, it often precedes increases in spending. Because nearly three-quarters of economic activity is accounted for by such expenditures, analysts watch the labor market closely. In general, the unemployment rate is a significant indicator of direction and strength in terms of where an

economy is heading, hence its relevance to stock market performance.

4.3.5 Interest Rate

Interest rates (INT) are a fundamental variable in financial economics, often chosen for their pivotal role in influencing stock market dynamics. This choice is grounded in the foundational work of Geske and Roll (1983), who posited the influential 'Fed model', suggesting a critical interplay between interest rates and equity values. Interest rates, set by central banks, can influence the cost of borrowing, the return on savings, and ultimately even investment decisions as well as consumer spending. However, their impact on stock markets is quite multifaceted: lower interest rates tend to result in a reduction of the discount rate used on future cash flows, which can increase stock valuations. In contrast, higher levels may produce an opposite effect.

In addition, according to modern science, for example, Cheung and Ng (1998) analyze the reaction of share prices as a response to monetary policy decisions. Their results show that interest rates do affect stock markets, the direction of which affects inflation.

It is also vitally important to understand how interest rates affect it, especially regarding the London Stock Market and FTSE 100 Index. The monetary policy in the UK, determined mostly by interest rate choices made at the Bank of England, is directed towards financial markets. Focusing on the correlation between interest rates and the FTSE 100 Index, this study will shed light on how monetary policy could impact one of the most significant stock markets worldwide, illuminating investors and policymakers.

4.3.6 Exchange Rate

This is based on the significance of exchange rates (EXC) in global financial markets and their critical effect on stock market indices, especially the FTSE 100. Exchange rates capture how much a currency is worth in terms of another and affect international trade, flows between countries' investments within their borders, and economic confidence. It can significantly impact the profitability of firms, especially if they are importers or have revenues and money in foreign currencies.

Necessary research by Agwu and Haydar (2023) laid out the basic tenets of exchange rate dynamics underlying their economic ramifications. Their efforts elucidate the correlation between fluctuations in currency exchange rates and the subsequent impact on global

competitiveness, balance of payments, and stock markets. Studies like Bahmani-Oskooee and Saha (2016), which were conducted recently, focus on the effects of exchange rate changes, identifying how different sectors within a stock market respond to currency fluctuations.

London Stock Exchange and their FTSE 100 Index, with a large proportion of multinationals, due to they know how exchange rate fluctuations affect them. Currency fluctuations can directly affect the earnings of these companies, which in turn affects their stock price and hence leads to changes in index performance. This research seeks to describe this relationship, providing information on how movements in exchange rates and other macroeconomic factors determine the behavior of one of the world's largest financial markets.

4.3.7 Crude oil prices

In turn, crude oil prices (OP) are considered a key variable of this study to reflect their significant influence on world economies and financial markets, in particular the stock indices such as FTSE 10. Crude oil prices are an important economic index that affects inflation, consumer spending, and the cost of production transportation. Oil price shocks affect the economy and, therefore, have implications for how a nation's stock market performs (Hondroyiannis and Papapetrou, 2001). Nevertheless, his research illuminated the correlation between fluctuations in oil prices and the occurrence of economic recessions and declines in the stock market. The correlation between oil prices and stock markets has therefore been subject to additional examination, as shown by the research conducted by Gay, Jr. (2011). which specifically focused on this connection and explained how increases in crude price levels tend to directly as well as indirectly impact the values of stocks. In that case, the FTSE index includes companies heavily engaged in the product use of energy products.

4.4 Data processing

Prior to the empirical analysis, several key preprocessing steps were undertaken to refine and standardize the data, ensuring its suitability for econometric analysis. Firstly, non-ratio data underwent logarithmic transformation. This step is instrumental in stabilizing variance across the dataset and mitigating potential heteroskedasticity issues, which are common in time-series data. Logarithmic transformation is particularly beneficial in financial and economic analyses

where it helps to linearize relationships and reduce the impact of large-scale discrepancies. FTSE, OP and IP are non financial data, therefore the natural logarithm is adapted for these three factors. LN stands for logarithmic, D stand for first difference, DL stand for first logarithmic differences, imply it with all variable is DL.FTSE, D.CPI, DL.IP, DL.OP, D.UN, D.INT, D.EXC. In addition to logarithmic transformation, the dataset underwent a differencing process. Differencing is a critical step in preparing time-series data, particularly useful in removing trends and seasonality, thus rendering the data stationary (Wooldridge, 2019).

A winsorization method was used to minimize the influence of outliers on regressions. The process involved restricting all variable lower and upper limits to 1st percentile values, outlier removal. So, winsorisation is a prevalent method that ensures the proper treatment of outliers without affecting overall integrity in financial data sets (Brownen-Trinh 2019).

The three preprocessing techniques discussed above – logarithmic transformation, differencing and winsorisation conform to the rules used in financial-economic data analysis. They make the empirical analysis more valid and reliable by ensuring that data actually represents actual economic processes and relationships. However, the application of these techniques before running a regression model provides an in-depth and comprehensive viewpoint for analyzing some intricacies related to financial time-series data.

4.5 Unit root test (Augmented Dickey-Fuller test)

When considering a time series, which is simply an arrangement of points over time, it becomes imperative to figure out whether there is any stabilized trend. The process is referred to as stationarity testing. A time series is considered stationary if the physical quantities, such as mean and variance, are not changing through time. This regularity is important because it means that the relationship between different variables in our analysis could not be deceptive or biased by changes in data trends. Before 1979, there was no accepted method to test for this stationarity. However, after that was the Dickey-Fuller test, an innovative new technique developed by statisticians Dickey and Fuller. This test determines whether a time series is nonstationary, i.e., it has the unit root and its characteristics change over the period or not stationarity, which does not contain any unit roots with an unchanging nature throughout the given duration.

Stock and Watson (2020) state that the Dickey-Fuller test consists of two hypotheses. The null hypothesis posits that the time series has just one root and, thus, is not in a stationary state. Unlike the null hypothesis, the alternative one implies that there is no unit root and, therefore, a stationary time series. Rejecting the null hypothesis after testing with Dickey-Fuller means that our data set is stationary, which allows us to do more accurate and relevant statistical analysis.

4.6 Serial correlation

The Pearson Correlation Coefficient, created in 1985, is a statistical metric that quantifies the strength and direction of the linear link between two continuous variables. This is useful for the time series analysis where data points are dependent on each other. The Pearson coefficient values range between -1 and +1. A coefficient of +1 signifies a perfect positive linear relationship (as one variable increases, so does the other); -1 indicates a perfect negative linear relationship (as one variable increases, the other decreases); and 0 means no linear relationship. The Spearman Rank Correlation Coefficient, developed in 1904, quantifies the extent of a monotonic link between two variables. This means it assesses whether the relationship between variables is consistently increasing or decreasing but not constantly. This test is instrumental when the data does not follow a normal distribution or involves ordinal data (data that is ranked but not necessarily evenly spaced). An added advantage of the Spearman test is its robustness to outliers, which can sometimes skew results in the Pearson test.

In our analysis, applying the Pearson and Spearman correlation tests allows us to gain a more rounded view of the relationships between economic indicators. This approach benefits financial time-series data, where variables may show linear and non-linear relationships due to various underlying economic factors and trends.

4.7 Econometric variables specification

To comprehensively understand the dynamics affecting the FTSE 100 Index and to identify the key economic indicators with the most significant impact before we running regression model, we conducted a series of Immediate Impact Model and One-Period Lag Model, and each regression is conducted independently, using distinct economic variables and their respective

time delays, to assess the immediate and delayed influence on the FTSE 100 Index in its unadulterated state. This methodology enables us to separate and analyse the specific influence of each individual variable. The regression model equations used to examine the correlation between the FTSE 100 Index and macroeconomic factors may be succinctly described as follows:

Immediate Impact Model:

$$\Delta DL.FTSE_T = \alpha_0 + \beta_1 \Delta Variable_t + \epsilon \quad (1)$$

One-Period Lag Model:

$$\Delta DL.FTSE_T = \alpha_0 + \beta_2 \Delta Variable_{t-1} + \epsilon \quad (2)$$

Here,

$\Delta DL.FTSE_T$ is the stock return at time T is the logarithm of the FTSE 100 index.

$\Delta Variable_t$ denotes the change of every macroeconomic variable under examination at time t.

$\Delta Variable_{t-1}$ is the one-period lag refers to the change in macroeconomic indicators from the previous period.

α_0 represents the intercept, β the coefficient of the variable, and ϵ the error term.

This analysis investigates the influence of various macroeconomic factors on the FTSE 100 Index using two models: immediate impact and one-period lag. The results show that quick fluctuations in CPI, IP, and UN lead to weak responses in the FTSE 100, indicating a delayed market response. Nevertheless, OP and EXC reveal distinct short-term impacts due to their high control over the stock market. INT, though not very pronounced in the short run, reveals a sizeable impact with a lag, suggesting that the stock market responds to changes in monetary policy only after some delay. As stated by the study (NEIFAR et al., 2021), the only macroeconomic factor influencing the UK stock market is the exchange rate (EXC), and interest rates did not have a substantial impact before the Global Financial Crisis 2008. These pre-results underscore the complex dynamics between macroeconomic variables and stock

market movements, with some factors exerting immediate influence while others have delayed effects.

4.8 Hypothesis and Model

The following equation examines the fisrt hypothesis:

H_o: Inflation does not affect stock market return.

H_a: Inflation does affect stock market return.

$$DL.FTSE_T = \alpha + \beta_1 D.CPI_t + \beta_2 DL.IP_t + \beta_3 DL.OP_t + \beta_4 D.UN_t + \beta_5 D.INT_t + \beta_6 D.EXC_t + \epsilon \quad (3)$$

Where:

α provides the contant, $\beta\ 1\ to\ 6$ are the coefficients of the independent variables, which effect each variables on stock returns.

DL.FTSE, the dependent variable representing the logorithmic differened FTSE 100 index.

D.CPI, D.UN, D.INT, D.EXC, the logorithmic differened independent variables.

DL.IP, DL.OP, differenced variables, as defined in Section 3.3.

ϵ is the error term.

4.9 Diagnostic Checks

To ensure the robustness and validity of the model, several diagnostic tests are conducted.

4.9.1 Autocorrelation

The Breusch-Godfrey LM (Lagrange Multiplier) test is used to detect autocorrelation in the residuals of a regression model. Autocorrelation occurs when the residuals, or errors, in a regression model are correlated across time, which can distort standard error estimates and lead

to misleading statistical inferences.

This test is particularly important in time-series analysis where data points are collected over time and are likely to be influenced by their previous values (Breusch & Pagan, 1979)

4.9.2 Heteroskedasticity

White's test is a statistical technique for detecting heteroskedasticity in a regression model. When the variance of the errors in a regression model is not constant across observations, heteroskedasticity arises. This test is critical because heteroskedasticity in regression analysis can lead to wasteful estimates and erroneous inference. The test entails regressing the original model's squared residuals on the original regressors, squares, and cross-products, and then determining whether these are jointly significant (White, 1980).

4.9.3 Multicollinearity

A VIF test measures the variance of an estimated regression coefficient caused by a correlation between predictors. Suppose the VIF value is between 1 and 5, identified as some weakness of correlation but not sufficiently strong to require attention. In that case, it shows that the model has multicollinearity, meaning one predictor variable in the CMM can be predicted linearly from others with great accuracy. Multicollinearity may complicate the interpretation of each variable’s separate impact and destabilize the regression model. After running an OLS regression, calculate the VIF for each predictor variable. Furthermore, VIF is defined as 1/(1-R2), where R2 represents the coefficient of determination from a regression between one specific explanatory variable and all other variables. A VIF value above one predicts excessively high correlations among the independent variables, which implies multicollinearity (Daoud, 2017).

4.10 The Newey-West standard errors

When autocorrelation and heteroskedasticity are found, regressions should be performed using Newey-West standard errors because it will reduce the possibility of unreliable statistics (Stock & Watson, 2021). The Newey-West standard errors refer to a sophisticated statistical tool that

enhances the OLS regression methods, especially in situations involving time series data that displays autocorrelation and heteroskedasticity. This estimator builds an error covariance consistent with heteroskedasticity, assuming the correlation between different periods. An important feature of the Newey-West estimator is its ability to provide more reliable and robust estimates by considering autocorrelation and heteroskedasticity inherent in financial data. This technique is critical in strengthening the validity of regression analyses for financial studies so that outcomes are reliable both statistically and economically.

5 Empirical Results

5.1 Augmented Dickey-Fuller test results

Table 1-2 Augmented Dickey-Fuller test outcomes after 1st difference

	ADF test	Outcome
DL.FTSE	-7.093	Stationary
D.CPI	-6.427	Stationary
DL.IP	-5.749	Stationary
DL.OP	-4.997	Stationary
D.UN	-4.932	Stationary
D.INT	-5.579	Stationary
D.EXC	-7.068	Stationary

Notes:

LN= logarithmic, D= First Difference, DL= First Logarithmic Differences

Source: Compiled by author

The variables must be checked for stationarity prior to estimating the regression models. In table 1-2 Augmented Dickey-Fuller test outcomes after 1st difference, The unit root test results are provided for both indices and monthly percentage change.

For the natural logarithm of the FTSE, the ADF test yielded a test statistic of -1.853 with a p-value of 0.3546. This result fails to reject the null hypothesis of a unit root, indicating non-stationarity in its original form. However, upon differencing, the test statistic drastically improved to -7.093 with a p-value of 0.0000, confirming stationarity after differencing.

Similarly, the CPI and its first difference, along with other variables like IP, OP, UN, INT, and EXC, were subjected to the ADF test. The original forms of these variables generally exhibited non-stationarity, with test statistics not significant at conventional levels, indicating the presence of a unit root. However, the different forms consistently showed significant test statistics, strongly rejecting the null hypothesis and confirming stationarity (Gujarati, 2003).

The transformation of the data through differencing, as evidenced by the ADF test results, is a critical step in ensuring the appropriateness of the data for the subsequent regression analysis. The achievement of stationarity in the different variables suggests that the time-series properties of the data have been adequately addressed, laying a robust foundation for examining the dynamic relationships between these economic indicators and the FTSE.

5.2 Descriptive Statistics

Table 1-3 Descriptive statistics of main variables

	N	MEAN	SD	MIN	MEDIAN	MAX
DL.FTSE	58	-0.0004	0.0415	-0.1165	-0.0109	0.1486
D.CPI	58	-0.0759	0.5698	-2.0000	0.0000	1.4000
DL.IP	58	0.0005	0.0319	-0.1007	0.0000	0.1661
DL.OP	58	-0.0026	0.1632	-0.6293	-0.0227	0.7143

D.UN	58	-0.0034	0.1184	-0.3000	0.0000	0.2000
D.INT	58	-0.0733	0.2018	-0.7500	0.0000	0.6500
D.EXC	58	0.0006	0.0309	-0.0684	-0.0005	0.0564

Source: Compiled by author

This section offers a comprehensive explanation of the sample size, mean, standard deviation, lowest value, median, and maximum value of each variable, in order to get an early understanding of their properties. This article provides a detailed study of the statistical characteristics of the variables using the given data. The sample size for each variable is close to 200, ensuring a statistically significant analysis with the ability to identify economic impacts.

In the analysis of the time-series data, descriptive statistics for seven key economic indicators were computed, revealing insights into their respective fluctuations and trends. The dataset comprised 57 to 58 observations for each variable, with a notable exception in the case of the GBP/USD exchange rate, which had one less observation. The FTSE exhibited a marginal average decrease of -0.0004, coupled with a standard deviation of 0.0415, indicative of moderate fluctuations within the observed period. A significant observation was the CPI, showing an average decrease of -0.0759 and a high standard deviation of 0.5698, suggesting notable inflationary movements.

IP maintained a near-stable mean change of 0.0005, reflecting relative steadiness in industrial output. Contrastingly, OP presented a slight average decrease of -0.0026, yet the standard deviation of 0.1632 pointed towards its typically volatile nature, as further evidenced by the wide range of observed changes. Changes in the UN and INT were also analyzed, with both showing minor average decreases and moderate variability, implying subtle shifts in employment conditions and potential monetary policy adjustments. The EXC demonstrated minor fluctuations, with a near-zero mean change and a relatively low standard deviation, suggesting a period of relative stability in the currency exchange rate. These descriptive statistics collectively provide a comprehensive overview of the economic environment during

the study period, highlighting key trends and variabilities in these critical economic indicators.

5.3 Correlation analysis

Table 1-4 Correlation analysis results between variables

	FTSE	CPI	IP	OP	UN	INT	EXC
FTSE	1.0000	-0.0851	0.0645	0.2838**	-0.2288*	-0.0986	0.4513***
CPI	-0.0388	1.0000	-0.0691	0.1301	-0.1632	0.0140	-0.3188**
IP	0.0893	0.0868	1.0000	0.0163	0.2197*	0.0275	0.1977
OP	0.2898**	0.1365	0.7558***	1.0000	-0.2100	-0.1285	0.2050
UN	-0.2506*	-0.1989	0.0555	-0.1481	1.0000	0.0962	0.1800
INT	0.1781	-0.0606	0.1571	0.0906	0.0884	1.0000	-0.0586
EXC	0.4138***	-0.2950**	0.0824	0.1156	0.1505	0.0364	1.0000

Note: indicate significance at the 10%, 5%, and 1% significance levels respectively (two-tailed test).

Previous descriptive statistical examination of the sample data showed that the data utilised in this work are rigorous and acceptable. Next, we may use correlation analysis to estimate the degree of correlation between variables. Whether variables have evident multicollinearity is

tested. This section tests each variable's connection using Pearson (1985) and Spearman (1904) coefficients. The test results are in Table 1-4. Pearson correlation coefficient results are in the bottom left corner and Spearman correlation coefficient results in the upper right corner.

Typically, when the absolute value of the correlation coefficient between variables exceeds 0.75, the correlation is considered strong and the issue of multicollinearity becomes more significant, resulting in variances in empirical findings. The variables exhibit a moderate connection when the magnitude of the correlation coefficient falls between the range of 0.5 to 0.75, or 0.25 to 0.5. When the magnitude of the correlation coefficient between variables is below 0.25, there is a very weak or nonexistent relationship.

The correlation analysis of key economic indicators revealed a complex interplay of relationships, highlighting both direct and inverse correlations of varying magnitudes. Among these, the correlation between changes in OP and IP was notably strong and statistically significant (0.7558***), suggesting a robust positive relationship between these two variables. Some other notable associations were found, although they are slightly weaker. For example, The FTSE had a modest positive association with the EXC, with a correlation coefficient of 0.4513***, meaning changes in stock price may be linked to fluctuations in foreign currency value. However, a negative relationship was observed between the CPI and EXC (-0.3188**), meaning that as consumer prices fluctuate so may currency exchange rate show an opposite effect.

In addition, the UN had a slightly negative correlation with FTSE (-0.2506*), which means that when unemployment rates alter there can be some changes in opposite proportion regarding stock market’s performance as well. These correlations reflect the changes that take place within the economy’s functioning different relationships of its elements, namely output, market performance as well as employment and currency value.

The changes in INT sometimes showed low correlations with other variables, and this indicated moving independently. This highlights the complex and multi-dimensional character of economic relationships, as well as importance for recognition interdependencies in modeling and analysis economics.

5.4 OLS Model results

Table 1-5 Linear regression

FTSE	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
CPI	.00299	.00921	0.32	.74699	-.01551	.02149	
IP	-.27274	.23704	-1.15	.25536	-.74886	.20337	
OP	.08345	.04751	1.76	.08514	-.01198	.17888	*
UN	-.09633	.04285	-2.25	.02902	-.18239	-.01026	**
INT	.04041	.02363	1.71	.09339	-.00704	.08787	*
EXC	.59371	.16409	3.62	.00069	.26412	.9233	***
Constant	.00294	.00509	0.58	.56631	-.00729	.01317	

Mean dependent var	-0.00005	SD dependent var	0.04176
R-squared	0.36268	Number of obs	57
F-test	4.74220	Prob > F	0.00068
Akaike crit. (AIC)	-212.96772	Bayesian crit. (BIC)	-198.66636

*** p<.01, ** p<.05, * p<.1

In the Ordinary Least Squares (OLS) regression analysis exploring the determinants of changes in the FTSE, several noteworthy findings emerged. The model, based on 57 observations, achieved an R-squared of 0.36268, indicating that approximately 36.27% of the variance in the dependent variable is explained by the model. The F-test statistic of 4.74220 with a p-value of 0.00068 denotes the overall statistical significance of the model.

Among the independent variables, EXC exhibited a highly significant positive coefficient (0.59371, $p < 0.01$), suggesting a strong and statistically significant relationship with the FTSE 100 index. Similarly, UN showed a significant negative coefficient (-0.09633, $p < 0.05$), indicating an inverse relationship with the dependent variable. The variable OP also displayed a positive coefficient (0.08345), which was marginally significant ($p < 0.1$). Conversely, CPI and IP were not statistically significant, with p-values of 0.74699 and 0.25536, respectively. This implies that within the scope of this model, changes in CPI and IP do not have a discernible impact on the FTSE with a positive coefficient. The coefficient for INT was also not significant at conventional levels, albeit it approached marginal significance ($p < 0.1$).

The model's constant term, representing the average value of FTSE when all independent variables are zero, was not significant, suggesting that the baseline level of the index change is not different from zero in a meaningful way. This finding highlights the FTSE 100 index's dependence on macroeconomic factors for its movements.

The regression analysis provides valuable insights into the factors influencing the FTSE, with currency exchange rate and unemployment rate changes showing significant associations. The findings underscore the interconnected nature of financial markets with macroeconomic variables and labor market conditions.

After analyzing the least squares (OLS) model, it can be concluded that the expression of the regression model in this article is:

$$DL.FTSE_T = 0.00294 + 0.00299D.CPI_t - 0.27274DL.IP_t + 0.08345DL.OP_t - 0.09633D.UN_t + 0.04041D.INT_t + 0.59371D.EXC_t + \epsilon$$

5.5 Regression of Newey-West

Table 1-6 Regression results of Newey-West estimation method

FTSE	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
CPI	.00299	.00929	0.32	.74917	-.01568	.02166	
IP	-.27274	.2295	-1.19	.24027	-.7337	.18821	
OP	.08345	.04366	1.91	.0617	-.00424	.17115	*
UN	-.09633	.02739	-3.52	.00094	-.15134	-.04131	***
INT	.04041	.03081	1.31	.19566	-.02148	.1023	
EXC	.59371	.20468	2.90	.00552	.1826	1.00482	***
Constant	.00294	.00507	0.58	.56477	-.00725	.01313	

Mean dependent var	-0.00005	SD dependent var	0.04176
Number of obs	57	F-test	3.69385

**** p<.01, ** p<.05, * p<.1*

In the refined regression analysis incorporating Newey-West standard errors to account for potential autocorrelation and heteroskedasticity, the model provided insightful outcomes on the dynamics influencing the FTSE. Conducted with 57 observations, the model's F-test statistic was 3.69385, indicating overall significance.

The variable UN exhibited a notably significant negative relationship with the FTSE. This suggests that increases in unemployment are associated with a decrease in the index, a finding that aligns with economic intuition. Similarly, the EXC showed a significant positive effect, highlighting the substantial impact of currency fluctuations on the stock market.

On the other hand, IP and CPI did not exhibit statistically significant effects, with p-values of 0.24027 and 0.74917, respectively. This indicates that within this model's framework, these variables do not significantly influence changes in the FTSE 100 index. The OP, while not significant at the conventional 5% level, approached significance ($p = 0.0617$), suggesting a potential impact on the index. Additionally, the INT showed a positive coefficient (0.04041), but it was not statistically significant ($p = 0.19566$). This implies that interest rate changes might not be a primary driver in the short-term movements of the FTSE 100 index.

The model's constant term, representing the expected value of the dependent variable when all predictors are zero, was not statistically significant. This outcome indicates that the baseline level of the index's change is close to zero when other factors are not considered.

The mean dependent variable was nearly zero (-0.00005) with a standard deviation of 0.04176, reflecting the variability in the index changes. The application of Newey-West standard errors ensures more robust inferences, particularly in the presence of autocorrelation and heteroskedasticity, thereby enhancing the reliability of our estimates.

In conclusion, the regression analysis with Newey-West standard errors provides a nuanced understanding of the factors influencing the FTSE 100 index. The findings underscore the significant roles of unemployment rates and currency exchange rates, while suggesting that other traditional economic indicators might have a more subdued impact in the context of this model.

5.6 Multicollinearity

Table 1-7 Variance collision factor test results

Variable	VIF	1/VIF
OP	2.74	0.364499
IP	2.62	0.382000
CPI	1.17	0.857943
UN	1.16	0.858434
EXC	1.15	0.866220
INT	1.04	0.962938
Mean VIF	1.65	

Source: Compiled by author

Further Analysis with VIF: Given the high correlation between OP and IP, it would be prudent to check the VIF values for these variables again. If the VIFs are significantly high (generally, a VIF above 5 or 10 is considered indicative of multicollinearity), it would confirm the multicollinearity concern.

In assessing the potential for multicollinearity among the variables in our regression model, a Variance Inflation Factor (VIF) analysis was conducted. The results revealed that while some degree of multicollinearity was present, it did not reach levels typically considered problematic. Specifically, the VIF for OP stood at 2.74, and for IP at 2.62, suggesting a moderate correlation between these variables. While these values are above the ideal threshold of 1, they fall well

below the commonly used threshold of 5 or 10, indicating that the degree of multicollinearity may not be severe enough to significantly distort our regression estimates.

Other variables, including CPI, UN, EXC, and INT, exhibited lower VIF values, all under 2. This further supports the notion that the overall multicollinearity in the model is manageable. The CPI and dinterestrate variables, in particular, showed VIF values of 1.17 and 1.04, respectively, indicating very low multicollinearity. Such findings suggest that these variables contribute independently to the model, without undue influence from inter-variable correlations.

The mean VIF across all variables was calculated at 1.65, a value that reinforces the conclusion that multicollinearity, while present to a certain extent, does not pose a significant concern in the current model. This level of mean VIF suggests a satisfactory level of variance inflation, allowing for a reasonable degree of confidence in the reliability of the regression coefficients obtained.

Overall, the VIF analysis forms an essential part of our econometric diagnostic process, ensuring that the model's estimations are not unduly influenced by multicollinearity. These results provide assurance that the regression model is statistically sound, with each independent variable contributing its unique explanatory power to the dependent variable, dlnFTSE100index.

5.7 Heteroskedasticity (White's Test)

Table 1-8 White heteroskedasticity test results

White's test for Ho: homoskedasticity
against Ha: unrestricted heteroskedasticity
chi2(27) =28.77
Prob > chi2 = 0.3722

In order to ensure that the above regression results are not interfered by the heteroskedasticity problem, this article conducted a White test. The null hypothesis and the alternative are:

H0: Homoskedasticity

Ha: Unrestricted heteroskedasticity

and the test results are as follows:

The White's test for heteroskedasticity was conducted to assess the constancy of variance in the residuals of our regression model. Under this test, the null hypothesis (H0) posits the presence of homoskedasticity (constant variance), while the alternative hypothesis (Ha) suggests unrestricted heteroskedasticity (variable variance). The test yielded a chi-square statistic of 28.77 with 27 degrees of freedom, resulting in a p-value of 0.3722. This p-value, being significantly above the conventional threshold of 0.05, leads to the failure to reject the null hypothesis of homoskedasticity. Consequently, this indicates that there is no significant evidence of heteroskedasticity in the residuals of the model.

Table 1-9 Cameron & Trivedi's decomposition of IM-test

Sourse	chi2	df	p
Heteroskedasticity	28.77	27	0.3722
Skewness	4.93	6	0.5529
Kurtosis	0.04	1	0.8394
Total	33.74	34	0.4803

In addition, the deconstruction of the IM-test by Cameron & Trivedi offers more insights. The decomposition dissects the heteroskedasticity test into constituent parts that evaluate skewness

and kurtosis. The skewness component, characterised by a chi-square value of 4.93 (with 6 degrees of freedom) and a p-value of 0.5529, as well as the kurtosis component, defined by a chi-square value of 0.04 (with 1 degree of freedom) and a p-value of 0.8394, both provide evidence that heteroskedasticity is not present. The chi-square statistic obtained was 33.74, with a corresponding degrees of freedom. The p-value obtained was 0.

Thus in general, the White's test and Cameron and Trivedi decomposition jointly state that our model does not have such problems of heteroskedasticity. This outcome is important because it justifies the use of conventional statistical inferences from a constant variance error assumption under our regression analysis. The lack of heteroskedasticity means that the estimators produced by our model are efficient and unbiased, hence gives accurate inferences regarding relationships studied.

5.8 Autocorrelation

Table 1-10 BG autocorrelation test results

Breusch-Godfrey autocorrelation test

H0: no serial correlation

	lags(p)	chi2	df	Prob > chi2
1	0. 434	1	0.5101	

In order to make sure that the results are good, this article also tests if the autocorrelation is working fine. These are our test results:

In a bid to ensure the robustness of our regression model, we used the Breusch-Godfrey LM test for detecting autocorrelation (serial correlation) in residuals. This test is indispensable to confirming error independence, an important assumption in time-series regression analysis. Correlation: This test comprises a null hypothesis (H0) of no serial correlation, and the

alternative is the presence of it.

With one lag {lags(p) = 1}, the test results returned a chi-square statistic of 0.434 with one degree of freedom. The null hypothesis is not rejected because the p-value is 0.5101, which exceeds the conventional significance level of 5%. This result shows no significant evidence of first-order autocorrelation in the residuals from this model.

6 Discussion

6.1 Main finding

This research aim to thoroughly investigation of the FTSE 100 Index. It analyzes the relationship between inflation and several controlled macroeconomic variables. The Newwy-West standard error provides a more accurate understanding of how these economic indicators influence the UK stock market. Compared with the initial OLS results, the significance of EXC has not changed, still at a level of 1%. UN raised its significance level as EXC, OP stayed at the same level, and INT lost its explanatory as well as IP. Recent study on London Stock Exchange, Agwu and Haydar (2023) revealed that EXC has a positive correlation even then CPI to FTSE. Bahmani-Oskooee and Saha (2016) state on EXC changes may affect different firms differently, depending on whether they are export-oriented or whether they use imported inputs intensively. Thus, the overall impact of exchange rate changes on the stock price index can go both ways. FTSE 100 index hold a significant number of global corporations, making it crucial for them to closely monitor the effects of currency exchange rate variations. Fluctuations in exchange rates directly affect the profits of these firms, which then influence their stock prices, resulting in changes in the performance of the index.

Surprisingly, instead of a strong CPI influence on the stock market as suggested by traditional economic modeling, our results display a more complicated and weak effect. The impact of inflation may take longer to show its relevance. According to that assumption, this paper also examined whether inflation has a lagged effect on stock returns by doing an immediate regression model and a period-lagged regression model between each selected variable and stock returns. The results discussed about CPI show no correlation with the movement of FTSE in the immediate regression model. However, one period-lagged regression gives slightly positive results and indicates a marginally significant impact in the short term. It accepts the hypothesis that one-period lagged inflation does affect the stock return, which gives support to long term relation. By using different method, Alagidede and Panagiotidis (2012) used quantile regression to find out the effect of inflation on different factors. The results proved that there is a positive correlation even for short periods of time. Afterall, the long-term studies consistently demonstrate a favourable correlation between inflation and stock returns (Geske & Roll, 1983; Gultekin, 1983; Boudoukh & Richardson, 1993; Granville & Mallick, 2004; Hasan, 2008).

There is a negative association between inflation and real activity, and there is a positive relationship between real activity and stock returns, according to Fama (1981). This shows that the negative relationship between stock returns and inflation is due to the negative relationship between inflation and actual activity. Even after taking into consideration the influence of actual activity, Christiano et al. (2010) demonstrate that a negative association between stock returns and inflation continues to persist. demonstrates that inflation is a significantly better explanation than economic activity for the negative association between stock return and return on investment. In order to handle the identical scenario, Geske and Roll (1983) constructed an expanded monetary model that included countercyclical monetary policy as an additional component. The reaction of the central bank to real activity, according to their argument, is countercyclical or anticyclical. In the event that economic activity drops, government income will also decrease. Since government expenditure is supposed to be fixed, the government will decide to create money in order to fund the deficit, which would ultimately lead to an increase in inflation. In addition, Park and Ratti (2000) provide their support to the research conducted by Geske and Roll (1983). The outcomes of this study indicate that increasing inflation is a signal of tightening of monetary policy, which results in a decrease in the anticipated real rate of return. It may be seen from this that monetary policy is a kind of indirect reasoning that is implemented in reaction to fluctuations in inflation. The Fisher model is expanded upon by Rushdi et al. (2012), who make use of the ARDL methodology and add actual activity and monetary policy into their analysis. On the other hand, they find that there is a significant inverse relationship between inflation and company stock returns.

Szczygielski and Chipeta (2015)state that actual activity in explaining stock returns is confounded by a large variety of actual activity indicators. The growth rate of IP and gross national product (GNP) are two widely used and competing indicators of actual activity. According to Fama (1990), cash flow is reflected in the link between stock returns and the pace of IP output growth. These justifications suggest that there will be a positive correlation between changes in IP and stock prices, supposing that predicted cash flows fluctuate with real activity. Since that the GNP growth rate is a measure of actual activity, it is anticipated to have an impact on returns that is comparable to that of IP. According to the one period-lagged regression results, IP shows a significant relationship with FTSE. GNP, according to Cheung and Ng (1998), is a proxy for cash flow shocks in the stock market and measures actual activity. It may be assumed that the rate of return through the mechanism is influenced by any factor that directly measures or represents real activity, not just industrial production or GNP.

Hasan (2008) examined the relationship between stock returns and inflation in the UK but did not consider the impact of global market developments; the result did not fully reflect a positive correlation. Based on the same fact, this study also did not consider any global equity index. However, a lot of studies show market index is a key factor due to global economic integration. Kwon and Yang (2008) state that traders refer to other market indices when making investment decisions, suggesting that stock prices reflect the movements of one or more market indices.

The source of inflatio has been paid attention by some studies. There are a range of factors contribute the high inflation in UK previous 3 years, due to geopolitical tensions, and epidemics disrupt supply chains, led to shortages of materials and price increases. The cost of electricity and gas had been risen and brought significant pressure in UK. Materials sector is the largest sector in the FTSE 100, accounting for almost 20 percent of the index, the rised commodity prices, such as OP, metals, and agricultural products, brought higher profit and corporate profitability (UK-ONS, 2023). Similar statement has been proved by Christiano et al. (2010), argues that high inflation erodes purchasing power, impacts consumer spending, and affects corporate profitability, which can be reflected later in stock returns. Thus, the stock price may not effected during last 3 year.

Following up statement, the inflation may not impact the different industries in same way. The rest part of FTSE is financials sector (17 percent) and consumer goods sector(16 percent). Energy and industrials follow with 12.4 percent and 8.7 percent, the financial sector is likely to be more effected by changes of INT. Geske and Roll (1983) suggested that stock returns are negatively correlated with interest rates. Further, Mishkin and Simon (1995) examined both short- and long-term Fisher hypotheses for the Australian market. The results show that the Fisher hypothesis failed to explain that short-term INT are related to fiscal policy and do not reflect expected inflation. Respectfully, this study gives the same empirical result: INT has no correlation with stock returns. Changes in money supply and INT are two widely considered factors in the stock return model. However, this study focuses on the impact of direct factors such as inflation, interest rates and industry production on stock returns. The inclusion of two variables with the same nature in the model may complicate the model, making it difficult to determine the impact of each factor. It is recognized that although the money supply is not considered directly, its impact may be indirect through other variables such as inflation or interest rates, as changes in the money supply affect these factors (Elton, 1995). As the statement of Cheung and Ng (1998), argue that money supply fluctuations affect stock returns

through their effect on inflation uncertainty, in the absence of a corresponding increase in economic output, an increase in the money supply leads to inflation because more money is chasing the same amount of goods and services.

6.2 Contemporary challenges and further research

Investigate how different industries in the stock market are uniquely affected by exchange rate fluctuations and inflation. It is suggested that future research could expand the understanding of market dynamics by including money supply as a variable and exploring its direct impact on stock returns.

One of the primary challenges arises from the integration of advanced technologies such as algorithmic trading and artificial intelligence. As Aldridge (2013) notes, these technologies have dramatically altered market dynamics, enabling trades at unprecedented speeds and volumes. This development has challenged existing financial models.

The post-2008 financial landscape further complicates this scenario. In response to the financial crisis, central banks globally have adopted unconventional monetary policies, notably quantitative easing. As Joyce (2015) elaborates, these policies have introduced novel dynamics into stock markets, presenting a challenge to traditional financial models. This shift calls for a reassessment of prevailing theories to accommodate the impacts of such monetary policies on market behavior.

In addition, the increasing emphasis placed on environmental, social, and governance (ESG) concerns in investing strategies has given an additional layer of complexity to the analysis of the stock market. Investors are increasingly considering these non-financial factors in their investment decisions. The significant influence of ESG factors on financial performance, as highlighted in studies by Friede et al. (2015), underscores the need for financial models to incorporate these broader considerations.

These developments emphasize the need for a flexible and adaptive approach in financial analysis. Incorporating the impacts of large-scale events and understanding the interplay of various economic and non-economic factors are crucial for a comprehensive analysis of stock market dynamics. The evolving nature of financial markets demands that analysts and

researchers continually update and refine their models to navigate the complexities of the modern financial world effectively.

6.3 A more focused period

Table 1-11 Linear regression-2021.09 to 2023.08

dlnFTSE100index	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
dCPI	.01004	.01037	0.97	.34936	-.0122	.03228	
dlnIP	.2867	.84163	0.34	.73843	-1.51842	2.09181	
dlnoilprice	.00798	.07915	0.10	.92111	-.16178	.17774	
dumemploymentrate	-.09633	.06049	-1.59	.13361	-.22608	.03341	
dinterestrate	.00309	.03164	0.10	.92369	-.06478	.07096	
dGBPUSDBGNCurncy	.7492	.22407	3.34	.00483	.26862	1.22979	***
Constant	-.00208	.01048	-0.20	.84543	-.02456	.02039	

Mean dependent var	-0.00290	SD dependent var	0.03445
R-squared	0.54397	Number of obs	21
F-test	2.78327	Prob > F	0.05370
Akaike crit. (AIC)	-85.37901	Bayesian crit. (BIC)	-78.06735

*** p<.01, ** p<.05, * p<.1

Table 1-12 Regression with Newey-west standard errors --2021.09 to 2023.08

dlnFTSE100index	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
dCPI	.01004	.00776	1.29	.21672	-.00661	.02669	
dlnIP	.2867	.73843	0.39	.70367	-1.29708	1.87048	
dlnoilprice	.00798	.05588	0.14	.88847	-.11187	.12783	
dumemploymentrate	-.09633	.06578	-1.46	.16518	-.23742	.04476	
dinterestrate	.00309	.02143	0.14	.88755	-.04288	.04905	
dGBPUSDBGNCurncy	.7492	.17678	4.24	.00083	.37006	1.12835	***
Constant	-.00208	.00619	-0.34	.74159	-.01535	.01119	

Mean dependent var	-0.00290	SD dependent var	0.03445
Number of obs	21	F-test	6.22657

*** p<.01, ** p<.05, * p<.1

To have a better understanding of how inflation affects stock returns deeply, a 24 months returns on the FTSE 100 index from September 2021 to August 2023 is analyzed using the least squares (OLS) and Newey-West regression methods. GBP/USD exchange rates, there is a strong positive link between exchange rates and the FTSE 100 index. This implies that the index increases as the pound appreciates versus the US dollar. This predictor has the highest level of importance in both models. Oil prices, despite the positive coefficient indicating a potential link between higher oil prices and a rise in the value of the index, the association is weak and lacks statistical significance. This shows that oil prices were not a reliable predictor of FTSE 100 index returns over the specified time. Unemployment, a negative coefficient indicates a reciprocal correlation with the FTSE 100 index. An upward trend in unemployment is linked to a downward trend in the index, but the correlation is not statistically significant. This implies that the condition of the labour market can influence market performance. Neither the Consumer Price Index nor the Industrial Production were shown to be significant predictors of index changes in this model, indicating that they did not strongly indicate stock market performance during the time.

Correlation analysis reveals that there is no substantial relationship between interest rates and the FTSE 100. Consequently, fluctuations in interest rates did not have a noteworthy influence on stock returns within the observed time frame.

The coefficient of determination, also known as the R-square value, indicates that about 54% of the variability seen in the FTSE 100 index in the ordinary least squares (OLS) regression can be accounted for by the included variables. The use of the Newey-West adjustment, which addresses the possibility of autocorrelation and heteroskedasticity, did not result in substantial alterations to the coefficients. However, it did have an impact on the standard errors and t-values associated with the coefficients.

To summarise, there is a considerable correlation between the exchange rate and stock market performance. However, other conventional economic indicators like CPI, industrial output, and the price of oil do not seem to have a major impact throughout the observed time. These findings imply that market participants may have been more swayed by currency values than by other macroeconomic variables throughout the two years. The hypothesis was rejected throughout this period still.

Table 1-13 Linear regression -2018.09 to 2021.08

dlnFTSE100index	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
dCPI	-.01206	.0167	-0.72	.47614	-.04627	.02215	
dlnIP	-.4146	.28581	-1.45	.158	-1.00006	.17085	
dlnoilprice	.088	.06138	1.43	.16275	-.03773	.21372	
dumemploymentrate	-.0972	.05664	-1.72	.09722	-.21323	.01883	*
dinterestrate	.2014	.0646	3.12	.00419	.06907	.33372	***
dGBPUSDBGNCurncy	.34527	.2275	1.52	.14031	-.12074	.81129	
Constant	-.00236	.00643	-0.37	.71668	-.01552	.01081	

Mean dependent var	0.00153	SD dependent var	0.04654
R-squared	0.48253	Number of obs	35
F-test	4.35160	Prob > F	0.00318
Akaike crit. (AIC)	-125.46943	Bayesian crit. (BIC)	-114.58200

*** p<.01, ** p<.05, * p<.1*

Table 1-14 Regression with Newey-west standard errors

dlnFTSE100index	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
dCPI	-.01206	.01895	-0.64	.52962	-.05087	.02675	
dlnIP	-.4146	.22868	-1.81	.08057	-.88304	.05384	*
dlnoilprice	.088	.04877	1.80	.08195	-.01191	.1879	*
dumemploymentrate	-.0972	.02747	-3.54	.00142	-.15346	-.04094	***
dinterestrate	.2014	.02578	7.81	0	.14859	.2542	***
dGBPUSDBGNCurncy	.34527	.23806	1.45	.15807	-.14237	.83292	
Constant	-.00236	.00557	-0.42	.67548	-.01376	.00905	

Mean dependent var	0.00153	SD dependent var	0.04654
Number of obs	35	F-test	327.52708

*** p<.01, ** p<.05, * p<.1*

To have a more depth explore of the FTSE 100 index, this study decided to conduct a 36-month OLS regression before 2021 September. The UK has seen a surge in inflation over this era. Results of Ordinary Least Squares (OLS) Regression for Tables 1–13:

CPI (Consumer Price Index et al.): The negative coefficient indicates a reverse correlation with the FTSE 100 index, however, it is not statistically significant (p-value: 0.47614). Industrial Production (IP) refers to the measure of the output of the industrial sector of the economy. The

study identified a negative correlation with the FTSE 100 index, however it did not reach statistical significance (p-value: 0.158). Oil Prices: The presence of a positive coefficient suggests a possible connection between higher oil prices and higher index values. However, it is important to note that this association is not statistically significant, as shown by the p-value of 0.16275. Rate of unemployment: The data suggests a weak and somewhat significant inverse correlation with the index (p-value: 0.09722), indicating that greater levels of unemployment might potentially result in lower index values. Interest Rate: The correlation between the FTSE 100 index and interest rates is strongly positive (p-value: 0.00419), indicating that when interest rates go up, the FTSE 100 index likewise tends to climb. The exchange rate between GBP and USD is positively connected, while the correlation is not statistically significant (p-value: 0.14031).

Regression results of using the Newey-West method are shown in Tables 1–14. And the interpretation of results:

CPI: The link remains weak and statistically insignificant even after accounting for autocorrelation and heteroskedasticity. Industrial Production: The inverse correlation between industrial production and the FTSE 100 index becomes somewhat significant (p-value: 0.08057), indicating that industrial production may have a negative impact on the FTSE 100 index. Oil Prices: Consistent with the ordinary least squares (OLS) findings, the positive correlation is somewhat significant (p-value: 0.08195), suggesting a possible influence on the index. The correlation between unemployment rate and stock market performance is now very significant (p-value: 0.00142), further supporting the notion that greater unemployment rates have a negative impact on the stock market. Interest Rate: There is a strong and statistically significant positive link (p-value: 0) between interest rates and the movement of the FTSE 100 index, indicating that interest rates are a substantial predictor of the index's movement. The exchange rate between GBP and USD is favourable but lacks significance.

Both models have an R-squared value below 0.5, indicating that while the models account for a portion of the fluctuations in the FTSE 100 index returns, more than half of the variability is attributable to external variables not included in the models. The salient factors indicate that the FTSE 100 index was impacted by interest and unemployment rates throughout this time frame.

The UK has had a high of inflation throughout this period. This sub-regression examines the correlation between macroeconomic variables and the FTSE 100 index throughout two distinct time frames: 24 months and 36 months. The analysis employs regression analyses using Ordinary Least Squares (OLS) and Newey-West standard errors as always. The results from the shorter 24-month period revealed a notable and positive relationship between the **exchange rate** and the index. According to recent study on London Stock Exchange, Agwu and Haydar (2023) revealed that EXC has a positive correlation even he selected period before 2008. Bahmani-Oskooee and Saha (2016) also state significant impact from exchange rate, consider the sector of FTSE's company, international company has a big percentage in it, respectfully, EXC may impact greater then CPI. This also indicates that a stronger pound was linked to higher index values, possibly due to increased foreign investments or repatriated profits that boosted stock prices. During the extended 36-month timeframe, **interest rates** were shown to have a notable positive impact on the index. Based on the fact of bank of England raised interest rates 10 times during the pandemic time (UK-ONS, 2023). As we have already been discussed the money policy of increasing interest rates to lower the inflation before, this may be attributed to the possibility that higher rates are implemented as a measure to control inflation during a strong economy, hence enhancing the profitability of the financial industry.

During both eras, the stock market was affected by both unemployment rates and oil prices, but their effect varied in magnitude. This suggests that their influence on the stock market is intricate and has several aspects. The index was adversely influenced by unemployment, indicating the market's responsiveness to the state of the labour market. However, the effect of oil prices was less straightforward owing to the varied composition of firms in the FTSE 100. The fluctuation in these connections throughout the two time periods highlights the dynamic interplay between macroeconomic factors and stock market performance, influenced by both local economic policies and global financial patterns. The study hypothesis was rejected by all the models' result during different time of periods, only the **ONE-PERIOD LAG** model accepted null hypothesis which is noteworthy. The reasons for the impact of macroeconomic conditions on stock returns have been previously discussed in section 6.1 and will not be reiterated here.

7 Conclusion

In this comprehensive study, we conducted Ordinary Least Squares (OLS) and Newey-West standard error-enhanced regression analyses to explore the impact of various macroeconomic variables on the FTSE 100 Index. Utilizing 57 observations, the OLS regression model exhibited an R-squared value, highlighting that about 36.27% of the index's variance could be explained by our model. From the OLS model, we discerned that the exchange rate (EXC) had a highly significant positive effect on the FTSE, as did the variable oil price (OP) and interest rate (INT), albeit with marginal significance. Conversely, the change in the unemployment rate (UN) displayed a negative correlation with the index at a level of 5%.

Further refining our analysis with Newey-West standard errors to address autocorrelation and heteroskedasticity concerns, the model yielded similar insights with additional nuances. The unemployment rate (UN) negatively influenced the FTSE 100, reinforcing the results of the OLS model. The EXC still exhibited a significant positive effect, highlighting the importance of currency fluctuations for stock market dynamics. However, changes in industrial production and CPI remained insignificant in terms of their influence on the FTSE 100 Index. In both analyses, the coefficient had a positive sign and was not statistically significant enough to conclude that interest rate changes played a limited role in short-term fluctuations of the index.

Moreover, additional findings are based on the focused regression analysis using Newey-West Standard Errors over a 24-months and a 36-months during 2018 September to 2023 August, which reveal other driving forces of the FTSE100 Index. In the analyzed variables, EXC had a very significant positive effect on the FTSE 100 Index. Along with interest rates showed up in same significant level of statistic on FTSE 100 index. This conclusion rejected the research hypothesis on the impact of inflation on stock returns.

This specific analysis allows us to better appreciate the intricate relationship between macroeconomic indicators and stock returns. It draws attention to the overwhelming influence of exchange rate changes while implying that the effect of coinage and other classical economic pillars on stock can be more delicate or erratic. Although this research cannot serve as a roadmap for investment planning, the results indicate how multi-dimensional considerations of direct and indirect influences of all economic factors are necessary when discussing stock market dynamics.

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