EXAMINING EQUITY MARKET'S RESPONSE TO INFLATION AND UNEMPLOYMENT NEWS IN SOUTH AFRICA

MASTER OF MANAGEMENT IN FINANCE AND INVESTMENT

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Abstract

This study investigates the response of equity prices to inflation and unemployment news in South Africa by providing evidence at both aggregate and industry levels. The findings indicate that inflation news has a negative impact on the equity returns of the JSE All Share Index, Basic Materials, Consumer Goods, Financials, and Technology during economic contractions. Inflation news also has a negative impact on equity returns of Consumer Goods during economic expansions. Furthermore, the study reveals that unemployment negatively impacts the stock returns of the JSE All Share Index, Financials, Industrials, Consumer Services and Consumer Goods during economic expansions. The equity returns of Basic Materials are negatively affected by unemployment news during contractions and expansions. Health Care equity returns are also negatively impacted by unemployment news during economic contractions. The study finds that unemployment news has a greater impact on Financials, whereas inflation news has a greater impact on Technology. Policymakers are advised to promote economic diversification, particularly in industries that exhibit significant negative impacts during economic contractions, such as Basic Materials, Financials, Consumer Goods, and Technology. Moreover, implementing risk-mitigation strategies and developing hedging mechanisms can safeguard against inflation-related challenges. Employment support programs are crucial to counter the negative impact of unemployment news on various assets, including the JSE All Share Index, Consumer Goods, Basic Materials, Financials, Industrials, and Consumer Services, particularly during expansions. Furthermore, industry-specific policies tailored to vulnerable industries may include targeted or regulatory incentives. Continuous market monitoring and ensuring timely access to accurate information is crucial.

KEYWORDS: Equity market; South Africa; inflation news; unemployment news; business cycle index.

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List of Abbreviations and Acronyms

Key Acronyms	Meaning
ADF	Augmented Dickey-Fuller
BCI	Business Cycle Index
BRICS	Brazil, Russia, India, China, South Africa
CPI	Consumer Price Index
ECB	European Central Bank
EMH	Efficient Market Hypothesis
Fed	Federal Reserve
FOMC	Federal Open Market Committee
GDP	Gross Domestic Product
HAC	Heteroscedasticity and Autocorrelation Consistent (HAC)
ICB	Industry Classification Benchmark
J203	JSE All Share Index
J510	Basic Materials
J520	Industrials
J530	Consumer Goods
J540	Health Care
J550	Consumer Services
J560	Telecommunications
J580	Financials
J590	Technology
JSE	Johannesburg Stock Exchange
NARDL	Nonlinear Autoregressive Distributed Lag
NBER	National Bureau of Economic Research
OECD	Organisation for Economic Co-operation and Development
OLS	Ordinary Least Squares
PPI	Producer Price Index
SARB	South African Reserve Bank
STDEVNEWS	standardised surprise news
VAR	Vector Autoregressive
VSE	Vienna Stock Exchange

1 Introduction

1.1 Background

The South African economy stands at a crossroads, grappling with challenges and opportunities that shape its economic landscape. As a crucial component of the financial system, the equity market plays a pivotal role in reflecting and responding to economic indicators, particularly those related to inflation and unemployment. The country's economic trajectory is closely tied to the performance of its equity market, making an in-depth examination of market responses to inflation and unemployment news imperative (Gonzalo and Taamouti, 2017). This study provides a comprehensive background and analysis of the intricate relationship between South African equity prices and these key macroeconomic variables at the aggregate and industry levels. According to the World Bank Group (2018), South Africa, as an emerging market, experiences economic fluctuations influenced by several factors. Among these, inflation and unemployment stand out as critical indicators that impact economic stability, investor confidence, and overall growth prospects.

The effects of inflation and unemployment on equity prices vary depending on the state of the economy, as evidenced by the differing responses to news of these factors (Boyd, Hu and Jagannathan, 2005; Jareño, Tolentino and Torrecillas, 2018). Investors, fund managers, and policymakers must understand these responses to make well-informed decisions and navigate the complexities of the financial landscape (Fromentin, 2022). South African policymakers confront the ongoing challenge of steering the economy towards sustainable growth while simultaneously addressing the issues of unemployment and inflation. By closely monitoring the equity market's response to policy changes and economic indicators, the effectiveness of current strategies can be assessed, and future policies can be shaped to foster economic resilience. Fluctuations in inflation and unemployment rates may influence a country's appeal to foreign investors, affecting currency valuation and overall economic competitiveness (Blanchard, 2013). A comprehensive analysis of the market's response offers insights into the global interconnectedness of the South African economy. Diverse industries within the equity market may exhibit distinct reactions to inflation and unemployment news. Examining these industrial dynamics helps to understand how specific industries adapt to economic conditions, providing valuable insights for investors and policymakers alike.

1.2 Research Gap

Previous research has focused on the stock market reactions to macroeconomic news in developed economies, particularly the global reactions to scheduled U.S. macroeconomic news announcements (Bouzgarrou et al., 2023). Despite the increasing significance of emerging markets such as South Africa, there is a limited understanding of how equity prices react to inflation and unemployment news. This knowledge gap is particularly relevant as inflation and unemployment rates are typically considered indicators of an economy's well-being and have been recognised as highly effective predictors of equity market behaviour. Although some suggestions have been made regarding the correlation between stock markets and macroeconomic variables, particularly unemployment and inflation rates, the relationship between the two is dependent on the state of the economy. These suggestions have been derived from studies that define business cycles, such

as those proposed by Boyd, Hu and Jagannathan (2005) and Jareño, Tolentino and Torrecillas (2018).

Despite extensive research on the South African equity market's responsiveness to economic indicators, such as inflation and unemployment, a significant research gap remains to be addressed. While previous literature has acknowledged the importance and impact of these macroeconomic variables on market dynamics, a comprehensive analysis of the market's response across different economic cycles is lacking (Cakan and Gupta, 2017; Robinson, Glean and Moore, 2018). Prior studies often focus on general trends or provide aggregated findings, neglecting potential variations in the equity market's response during periods of economic expansion and contraction (Gupta and Reid, 2013; Gupta and Modise, 2013). Moreover, although some studies have examined the impact of inflation and unemployment news individually, there is limited research that systematically compares and contrasts the relative influence of these two critical indicators on the equity market.

This research examines the Johannesburg Stock Exchange (JSE) and its diverse range of industries in the South African market. By analysing various industries, this study provides a comprehensive insight into how inflation and unemployment news affect national asset returns. However, a more in-depth investigation is necessary to understand how market participants interpret and respond to inflation and unemployment news in specific economic contexts and to provide a more context-specific understanding of the South African equity market dynamics. Addressing this research gap is essential for enhancing our understanding of the relationship between economic indicators and market behaviour in South Africa and enabling more informed decision-making by investors, policymakers, and other stakeholders. (Bouzgarrou et al., 2023).

1.3 Objectives of the Study

This study investigates the response of equity prices to inflation and unemployment news in South Africa by providing evidence at both the aggregate (the equity market or JSE All Share Index) and industry levels. The response of equity prices to inflation and unemployment news depends on the business cycle, and to determine this, the study uses Boyd, Hu and Jagannathan's (2005) regression analysis procedure. The following specific objectives contributed to the main objective:

a) To examine the response of equity prices to inflation news in South Africa at both aggregate and industry levels.

b) To examine the response of equity prices to unemployment news in South Africa at both aggregate and industry levels.

c) To examine which macroeconomic news, between inflation and unemployment in South Africa, has the most significant impact on the equity prices at both aggregate and industry levels.

1.4 Research Questions

a) How do the equity prices respond to inflation news in South Africa at both equity market and industry levels?

b) How do the equity prices respond to unemployment news in South Africa at both equity market and industry levels?

c) Which macroeconomic indicators, inflation or unemployment news in South Africa, have a more significant impact on equity prices at both the equity market and industry levels?

1.5 Contribution of the Study

Several studies have investigated the factors that influence equity prices, but the literature has generated diverse conclusions regarding the reactions of stock prices to macroeconomic news (Gardner, Scotti and Vega, 2022). This study contributes to the existing body of literature in various ways by examining the responses of equity prices in South Africa to news about inflation and unemployment at both aggregate and industry levels. First, it provides detailed insights into how each factor affects equity prices by comparing the responses. Second, this study contextualizes the responses of equity prices within distinct economic phases, namely expansions, and contractions, offering a more thorough understanding of how inflation and unemployment news impact South African equity prices under different economic conditions. Third, unlike previous studies, which often treated economic news as a monolithic influence, this study breaks down news into positive and negative categories for inflation and unemployment. Finally, by comparing the impact of inflation and unemployment news, this study provides a deeper understanding of the macroeconomic factors that significantly influence equity prices in South Africa. This distinction adds a layer of sophistication to existing literature that often focuses on singular economic indicators.

This study seeks to add to the existing body of literature by utilising the linear regression model proposed by Boyd, Hu and Jagannathan (2005), a departure from the methodologies employed in previous studies. In contrast to Cakan and Gupta (2017), who investigated the South African stock market's reaction to US inflation and unemployment news using the GJR-GARCH (1,1) model, this study adopts a different approach in the form of linear regression. Unlike Cakan and Gupta (2017), this study focuses on news from the domestic economy. Furthermore, using the event study method this research differs from Robinson, Glean and Moore's (2018) exploration of green firms' stock market returns in emerging markets. While Robinson, Glean and Moore Robinson et al. (2018) focused on short-term reactions, the linear regression model offers a distinct perspective on the long-term relationships between inflation, unemployment news, and equity price returns. This methodological departure, focus, and targeted market contribute to the uniqueness of the current study, providing a fresh perspective on understanding how economic news influences equity prices in South Africa.

The research of Gupta and Reid (2013) on the effects of Consumer Price Index (CPI) surprises on stock returns is expanded upon by this study, which examines inflation and unemployment and provides a comprehensive understanding of their combined influence. This study distinguishes itself from the investigation of Balcilar, Cakan and Gupta (2017) into the impact of US inflation and unemployment news on seven emerging Asian stock markets by focusing specifically on the South African context. This allows for a more detailed understanding of the unique dynamics and responses of the South African equity market. Additionally, this study extends Gupta and Modise's (2013) predictive regression model by incorporating a linear regression framework, offering a different perspective on the predictability of inflation rates in the South African stock market.

1.6 Significance of the Study

The South African stock market, represented by the Johannesburg Stock Exchange (JSE), is significantly influenced by macroeconomic variables and business cycles. GDP growth generally boosts stock prices as consumer spending and investment rise, while periods of economic recovery, such as post-2008, align with market upswings (Blanchard, 2013). High inflation erodes purchasing power and profits, negatively impacting stocks, whereas moderate inflation suggests a growing economy. Interest rates, set by the South African Reserve Bank (SARB), affect borrowing costs and liquidity; rate cuts during the COVID-19 pandemic spurred a market rally (World Bank Group, 2018). Exchange rate fluctuations, especially during political instability, affect companies with foreign revenue, adding to market volatility. Business cycles also play a critical role; expansions drive stock gains, while recessions lead to declines, as seen during the 2008 financial crisis and the commodity boom of the early 2000s (Bodie, Kane and Marcus, 2013).

Multiple studies have examined the connection between macroeconomic variables and stock prices using various methodologies, but limited research has been conducted on this topic in South Africa. This study aims to provide more recent evidence, focusing on the post-apartheid era, to examine the response of equity prices to inflation and unemployment news at both aggregate and industry levels. This is necessary because the South African equity market has undergone significant transformations since the end of apartheid and continues to experience technical advancements (World Bank Group, 2018). This evolution has improved the efficiency of the South African equity market, potentially increasing its sensitivity to macroeconomic news announcements (Cakan and Gupta, 2017). Moreover, the results provide valuable insights into how equity prices in similar emerging economies respond to inflation and unemployment news. The insufficiency of literature on emerging markets poses a risk of misjudging and misinterpreting emerging market dynamics for investors, researchers, and policymakers (Bouzgarrou et al., 2023).

Equity prices are of paramount importance in financial markets and play a significant role in economic development (Gonzalo and Taamouti, 2017). Analyzing their responses to domestic inflation and unemployment news in South Africa contributes to advancing financial and economic knowledge, benefiting academics, investors, and policymakers alike. Furthermore, this research adds to academic knowledge, assists investors in making informed decisions, and empowers policymakers to create effective policies. Prior research has explored the impact of changes in economic conditions on investor sentiment, market sentiment, and the overall functioning of financial markets (Ağirman, Karcıoğlu and Osman, 2018). These insights can be utilised to develop more precise models and frameworks for understanding emerging markets dynamics. Such findings contribute to developing theories and frameworks that better explain the dynamics of emerging markets and enhance our understanding of financial markets and their interplay with macroeconomic factors. Furthermore, academic research in this field can guide policymakers and regulators (da Silva et al., 2022).

The role of policymakers in shaping and implementing economic policies has been widely recognized by various lines of evidence (da Silva et al., 2022; Bouzgarrou et al., 2023). Despite being the largest stock exchange in Africa in terms of market capitalisation and ranking 17th globally, as reported by the World Bank. South Africa continues to grapple with high levels of unemployment and poverty. As discovered by numerous studies, inflation has a detrimental impact on economic activity and hampers growth in multiple ways. Tackling these pressing social issues

is of utmost importance and requires the attention of policymakers. In this regard, policymakers must examine the response of equity prices to inflation and unemployment news to understand better the transmission mechanisms between macroeconomic variables and financial markets. Such knowledge would enable policymakers to develop and implement strategies to stimulate economic growth, manage inflation, and create employment opportunities while identifying potential risks and devising suitable risk management strategies.

Understanding how equity prices react to inflation and unemployment news is crucial for making informed investment decisions and measuring investor expectations. Brzeszczyński et al. (2021) illustrate that by examining the prices' response to such news, investors can adjust their portfolios accordingly, potentially reducing risks and optimising returns. This is particularly important for investors considering investments in emerging markets, as their contributions are vital (Chen, Jiang and Hu 2018). Furthermore, Ikizlerli, Holmes and Anderson's (2019) comprehensive review of the response of different investor types to macroeconomic news demonstrates how such data enables investors to identify sectors or industries that are more resistant or sensitive to inflation or unemployment news. By gaining this knowledge, investors can make informed decisions about the stocks and assets that align with their investment goals and risk tolerance.

The following chapter concentrates on the theoretical background and empirical evidence of the response of equity prices to macroeconomic news announcements, focusing on inflation and unemployment news. This section will provide an overview of how equity prices react to news announcements, as this phenomenon is accompanied by changes in equity prices (Fromentin, 2022). Subsequently, the key theories and concepts that serve as the foundation for the empirical testing of the research will be presented to align the expected findings with existing theories. A thorough review of the most relevant theories and concepts that explain the expected findings was conducted. The efficient market hypothesis serves as the economic foundation for this research, and its connection to these concepts is based solely on existing literature. Finally, the effect of macroeconomic news on equity prices will be demonstrated by examining previous studies.

2 Literature Review

2.1 Theoretical Background

2.1.1 Overview of the Response of Equity Prices to Macroeconomic Announcements

The link between equity prices and macroeconomic fundamentals is one of the most researched topics in financial economics. Equity prices are an essential part of the research in finance and economics. The impact of both scheduled and unscheduled announcements is observed in the returns and volatility of financial markets, including the options and foreign exchange markets (Francis, Ravinthirakumaran and Ganeshamoorthy, 2021). It has been widely argued that macroeconomic announcements influence the behaviour of financial assets, while feedback effects from the markets on the economy have also been documented in the literature. A significant body of evidence has established that macroeconomic news generally affects equity returns. Therefore, following the pioneering works of Chen, Roll and Ross (1986), the impact of macroeconomic news releases on financial markets has received significant interest in the literature. In the present context, researchers, academics, and policymakers identify the vital impact equity prices have as efficient mechanisms of financial intermediation and as significant drivers of a country's economic growth (Gardner, Scotti and Vega, 2022).

From a theoretical point of view, the equity prices of individual firms are affected by conditions within an economy. This is primarily because economic conditions typically affect individual firms expected future earnings and dividends (Blanchard, 2013). Expected future earnings and dividends are related to a firm's share price through the required rate of return. It follows that any variable that affects a firm's earnings, dividends, and expected or required returns also affects the share price of the firm (Jarociński and Karadi, 2020). Robinson, Glean and Moore (2018) showed that equity prices react to macroeconomic news. A well-functioning financial system should promptly and rationally assimilate important macroeconomic information into its equity prices and returns. According to Fama (1970), the market should exhibit a "semi-strong form" efficiency. Theoretically and empirically, it is widely accepted that certain macroeconomic variables are risk factors for equity prices. In this context, the national statistical department's regular announcements of macroeconomic indicators have become a popular topic because of the corresponding reactions in the equity markets (Alexiou, Vogiazas and Taqvi, 2018).

2.1.2 Efficient Market Hypothesis (EMH)

The following chapter concentrates on the theoretical background and empirical evidence of the equity prices' response to macroeconomic news announcements, focusing on inflation and unemployment news. This chapter provides an overview of the stock price responses to news announcements. This news announcement phenomenon is accompanied by stock price changes (Fromentin, 2022). Subsequently, the key theories and concepts considered the theoretical foundation for the empirical testing of the research are presented, aiming to align the expected findings with existing theories. The most relevant theories and concepts explaining the expected findings were reviewed. Accordingly, the efficient market hypothesis was explored because it serves as the economic foundation for this research. The discussion of asset pricing and stock price responses to inflation and unemployment news is as follows. The connection between these

concepts is entirely based on existing literature. Finally, the effect of macroeconomic news on equity prices using past studies is demonstrated.

This theory can be extended to encompass the relationship between macroeconomic news and equity market prices, suggesting that equity prices should promptly reflect macroeconomic announcements made on a given day (Boyd, Hu and Jagannathan, 2005). The empirical section analyses historical inflation, unemployment news data, and equity returns. Macroeconomic news announcements, which will be elaborated later, were made at a particular time on a specific day. Nevertheless, equity returns rely on the stocks' daily closing prices. Consequently, a temporal gap exists between macroeconomic announcements and data on closing equity prices. Other events that affect equity prices may have occurred between announcement and closing price estimations. Consequently, this research is most accurately characterised as a semi-weak form test of the efficient market hypothesis.

Fama (1970) asserted that there is substantial evidence supporting the validity of this semi-weak form test. In line with these findings, the corresponding equity price data should reflect positive and negative macroeconomic announcements. If we adopt the premise that the efficient market hypothesis is valid, the expectations of these specific announcements should already be factored into equity prices. According to the efficient market hypothesis, equity prices should react to the unexpected components of macroeconomic announcements. This means that only the unexpected portion of the policy announcement, which represents a macroeconomic surprise, affects the equity prices. Chan, Chhagan and Marsden (2017) and Fausch and Sigonius (2018) agree that only unexpected changes in monetary policy, often referred to as monetary policy shocks, affect stock prices.

The efficient market hypothesis (EMH) posits that financial markets are efficient, meaning that asset prices fully reflect all available information. A key assumption underlying EMH is that investors are rational and make decisions based on maximizing utility. If investors are rational, they will use all available information to determine the fundamental value of assets, and prices will adjust quickly to new information (Degutis and Novickytė, 2014). However, the assumption of investor rationality has been challenged by behavioural finance research. Investors may exhibit psychological biases like overconfidence that lead to irrational trading. The stock market crashes of 1987 and the dot-com bubble in the late 1990s were difficult to explain based solely on changes in fundamentals, suggesting investor sentiment and irrationality played a role. Even if stock returns follow a random walk, consistent with EMH, this does not necessarily imply investors are rational. Studies have found large differences between the market capitalization and intrinsic value of stocks, suggesting mispricing. Predictable patterns in stock returns based on past prices or valuation metrics also cast doubt on the notion that investors are fully rational (Mikołajek-Gocejna and Urbaś, 2023).

2.1.3 Macroeconomic Variables and their Impact on Equity Prices

Equity markets play a pivotal role in shaping and reinforcing economic infrastructure. They serve as a platform through which fund seekers and fund providers come together and ensure mutual benefits among themselves and work together to ensure the economic stability of the respective countries (Jareño, Tolentino and Torrecillas, 2018). The equity market, the most significant source of funds driving industrial growth, is exposed to performance risk due to macroeconomic variables

prevailing in an economy. Consequently, researchers, policymakers, and investors have always been concerned about how the equity market reacts to macroeconomic variables (Ağirman, Karcıoğlu and Osman, 2018). Moreover, macroeconomic news announcements are crucial risk factors for financial markets. This is because the state of the economy is one of the primary sources of risk, as reflected in these announcements (Boyd, Hu and Jagannathan, 2005). This particular risk source cannot be considered diversifiable (Ekinci, Akyildirim and Corbet, 2019).

Balcilar, Cakan and Gupta (2017) state that a thriving equity market is widely recognised as a crucial factor in a country's economy. Stock markets play various economic roles, such as raising business capital and creating opportunities for small investors. Therefore, it benefits individual investors in addition to contributing to the country's economy. Given the significance of equity markets, asset pricing has been the subject of extensive research (da Silva et al., 2022). Various asset pricing theories provide the foundation for establishing a framework that links macroeconomic variables to stock market performance. Three notable theories in this context are the capital asset pricing model (Niu and Zhang, 2021), the arbitrage pricing model (Bhuiyan and Chowdhury, 2020), and the Discounted Cash Flow Model (Jarociński and Karadi, 2020). Asset-pricing models specifically designed for emerging economies have the potential to include factors such as the effects of monetary policy, liquidity dynamics, and indicators that reflect investor attention (Hadhri and Ftiti, 2017).

Statistical agencies in different countries regularly release scheduled public announcements containing macroeconomic data related to employment, inflation, prices, production, consumption, etc. Previous empirical studies have consistently demonstrated that the above selection of news releases is among the most significant influences on financial assets (Nikkinen and Sahlström, 2004). Although the timing and dates of scheduled news releases are known in advance, their specific information remains uncertain. Moreover, macroeconomic data are difficult and costly for private actors to estimate accurately. As a result, market participants are expected to closely monitor these announcements as they provide new insights into the state of the economy and, consequently, the appropriate valuation of financial assets.

Stock prices are anticipated to react to information, particularly unexpected data, regarding the dynamics of macroeconomic variables (Seok, Cho and Ryu, 2022). These developments systematically affect economic agents' expectations for the economy's future health. In effect, there is a direct impact on cash flows attributable to the change in the discount factor (which depends on the interest rate and risk premium) and, consequently, on asset prices across the board. However, empirical evidence supporting the impact of macroeconomic news on the market remains inconclusive (Gardner, Scotti and Vega, 2022). In some instances, important macroeconomic news has no discernible effect. This research study investigated two scheduled macroeconomic news releases: inflation news and unemployment news.

2.1.4 Inflation, Unemployment and Equity Market Returns

Extensive research has been conducted to explain the connections between expected and unexpected inflation, changes in inflation rates, and equity market returns. However, conflicting results have resulted in a contentious body of literature on this subject (Torrecillas and Jareño, 2013). Based on the literature, the reactions of equity prices to inflation can be categorized into three groups. First, there is no correlation group in which inflation rates have no noticeable effect

on equity market returns. Second, an inverse correlation is observed, in which equity market returns tend to decrease as inflation increases. This inverse relationship contradicts the generalised Fisher hypothesis, which suggests a positive relationship between inflation and equity returns. Finally, there is a positive correlation category, in which stock market returns increase as inflation increases. This positive correlation aligns with the generalised Fisher hypothesis, which suggests that higher inflation corresponds to higher stock market returns.

According to economic theory, when inflation exceeds expectations, it may lead to anticipation of more restrictive monetary policies, resulting in higher nominal interest rates (Blanchard, 2013). This leads to reduced cash flows and a higher discount rate in the stock valuation model, ultimately leading to lower stock prices (Bodie, Kane and Marcus, 2013). A positive inflation surprise (bad news), such as a higher-than-expected CPI, is linked to diminished savings and investments, increased input costs, and elevated cost of capital for firms in the economy. This is because investors demand greater returns to offset the inflation risk. These factors pressure firms, reduce profitability, and negatively impact stock returns (Blanchard, 2013). Consequently, we expect stock prices to react negatively to inflation news in line with (Khan and Khan, 2018).

Theoretically, as described by Boyd, Hu and Jagannathan (2005), stock prices are determined by three fundamental factors: the risk-free interest rate, the expected growth rate of corporate earnings and dividends, and the equity risk premium. However, no evidence has been found that indicates that unemployment news affects any measure of equity risk premium, as highlighted by Niu and Zhang (2021). Unemployment news affects stock prices by providing information about the risk-free interest rate and the expected growth rate of corporate earnings and dividends. The Gordon constant growth model commonly used for security valuation is considered to understand the influence of these three fundamental factors on stock prices. Gordon's model is as follows:

$$P = \frac{D(1+g)}{(r+\pi-g)} \tag{1}$$

Where r is the interest rate on long-term risk-free claims, P is the price of a security or portfolio, D is the last period dividend, g is the expected constant growth rate in D, and π is the risk premium investors require to invest in stocks.

The Fisher effect describes the relationship between nominal interest rates, real interest rates, and inflation. It states that the nominal interest rate is equal to the real interest rate plus the expected inflation rate. This means that as inflation increases, nominal interest rates should also rise to maintain the same real interest rate (Blanchard, 2013). However, the contrarian investment strategy appears to contradict the Fisher effect. Contrarian strategies involve buying stocks that have recently underperformed (losers) and selling stocks that have recently outperformed (winners). This is based on the premise that the market overreacts to news and information, causing stock prices to become temporarily mispriced. When these mispriced stocks eventually revert back to their fundamental values, the contrarian investor can profit (El Merbouh and Sönmezer, 2023).

The contradiction arises because the contrarian strategy implies that stock prices do not fully reflect all available information, as the efficient market hypothesis and Fisher effect would suggest. If markets were truly efficient, there should be no opportunity for contrarian investors to systematically outperform the market by exploiting temporary mispricing. The empirical evidence

on the profitability of contrarian strategies, suggests that markets may not be as efficient as the Fisher effect and traditional finance theory would imply. The overreaction and mean-reversion phenomena observed in stock prices contradict the notion of fully efficient markets where all information is immediately reflected in prices (El Merbouh and Sönmezer, 2023).

The research on this topic has been conducted by Boyd, Hu and Jagannathan (2005), who utilised unemployment rate announcements to predict the actual growth rate in the Index of Industrial Production. This serves as a proxy for the corporate dividend growth rate, and their tests showed that stock prices react significantly during economic contractions as opposed to economic expansions. Additionally, data for public utility and cyclical stocks provided further supporting evidence, showing that unemployment news carries a relatively higher amount of information regarding growth expectations during economic contractions compared to economic expansions. This suggests that changes in interest rate expectations primarily drive the reactions of prices to unemployment news. Gonzalo and Taamouti (2017) used the Fisher and Phillips curve equations to demonstrate that a high unemployment rate is accompanied by monetary policy action from the Federal Reserve (Fed), typically leading to a reduction in interest rates during high unemployment. As a result, stock market prices tend to increase.

2.2 Empirical Evidence

2.2.1 Evidence from US and Developed Markets Data

A great deal of previous research, including Fama (1981), Chen, Roll and Ross (1986), and Ferson and Harvey (1991), provided empirical evidence demonstrating the sensitivity of security prices to macroeconomic news. According to theoretical principles, equity prices are typically driven by expected discounted cash flows. Consequently, macroeconomic variables that affect the patterns of future discounted cash flows are expected to exert a notable influence on stock market reactions (Chen, Roll and Ross, 1986). Orphanides (1992) reported that stock price reactions to macroeconomic news depend on the state of the economy. In his book, Blanchard (2013) also highlights that within an equilibrium, the same news can sometimes be good or bad for financial assets, depending on the prevailing economic conditions, such as whether the economy is in the expansion or contraction phase.

Theoretically, when the unemployment rate is high, the Fed reduces the interest rate, which leads to an increase in stock market prices. Boyd, Hu and Jagannathan (2005) researched the US economy to establish stock price reactions to unemployment news. They note that news of a rising unemployment rate tends to increase stock market values during economic expansion. Conversely, during economic contractions, such news decreases the stock market returns. However, Tapa et al. (2016), in a study conducted in South Africa from 1994 to 2016, reject the notion that unemployment is a good predictor of stock market returns. The findings of the same study show that stock market development does not impact the unemployment rate. These findings provide evidence that the empirical evidence supporting the impact of macroeconomic news on the market remains inconclusive (Gardner, Scotti and Vega, 2022).

Gonzalo and Taamouti (2017) studied the reaction of stock market returns to unemployment on the short-run impact of anticipated and unanticipated unemployment rates announced on US stock prices between 1950 and 2014. Their analysis revealed that only the anticipated unemployment

rate significantly influences stock prices by employing nonparametric Granger causality and quantile regression-based tests. The quantile regression analysis highlights that the causal effects of the anticipated unemployment rate on stock returns differ across quantiles, indicating heterogeneity. An increase in the expected unemployment rate is typically considered good news for stock prices. Caruso (2019) employed the nowcasting method on 13 variables relative to the US economy, including inflation and unemployment news. The researcher found that the "Nowcasting Surprise Index" correlates well with asset prices every quarter. In addition, this study demonstrates that the accumulation of recent macroeconomic news data, which contains valuable information regarding the state of the economy, contributes significantly to explaining the behaviour of asset prices.

Niu and Zhang's (2021) comparative study investigates stock returns on post-macroeconomic announcement days using US data on inflation, the producer price index, and unemployment news, which is consistent with Savor and Wilson (2013). The data used for this study were from 1964 to 2019 and were tested using a fixed effects regression. The authors report that the stock market experienced notably lower returns on the days following the announcement. These findings agree with those of Gurgul, Mitterer and Wójtowicz (2020), in which significant changes in stock prices are predominantly observed in the first five minutes following a news release. Thereafter, the changes are deemed insignificant and of relatively smaller magnitude.

Du (2018) investigated market reactions to good and bad news announced by the Japanese government, the Japanese Central Bank (Bank of Japan), and international credit rating agencies between 2010 and 2016 and compared who carried more credibility. A regression model was applied to test the market's reaction to good and bad news from different institutions. Throughout the sample period, the market reacted considerably more strongly to positive news than to negative news. Similarly, Gurgul, Mitterer and Wójtowicz (2020), applied the event study methodology to investigate the impact of macroeconomic news on the US economy on 13 stock prices listed on the Vienna Stock Exchange (VSE). Comparing the effects of unexpected bad and good news, it is evident that good news results in a significant stock price reaction. These findings indicate that unanticipated macroeconomic news originating in the United States causes a significant stock price reaction following announcements. In most instances, significant changes in stock prices are predominantly observed in the first five minutes following the news release.

Gardner, Scotti and Vega (2022) investigated central bank communication and the response of equity prices to macroeconomic announcements using US data. By employing a nonlinear least-squares equation, they find that news has a greater impact on equity prices during challenging periods. In contrast, its effect is comparatively smaller during favourable periods, as described by the Federal Open Market Committee (FOMC) sentiment index. This finding aligns with the literature, which finds that stock market reactions depend on the prevailing economic conditions. These findings agree with those of Jareño, Tolentino and Torrecillas (2018), who employed the event study methodology to investigate the impact of inflation news on common sector stock returns. This methodology is associated with market efficiency. Analysing the announcement data for the period between January 1990 and April 2013 shows that sector returns demonstrate a strong reaction to CPI announcements, while showing no reaction to Producer Price Index (PPI) announcements. Furthermore, inflation announcements appear to impact when the economy is experiencing a downturn and the direction of news is negative. Consequently, the economy's

condition and the direction of surprises are crucial factors in analysing the impact of inflation news on abnormal returns.

Fausch and Sigonius (2018) investigated the impact of European Central Bank (ECB) monetary policy shocks on the German stock market by estimating regression and Vector Autoregressive (VAR) models. Their main findings indicated that the overall variation in excess German stock returns stems mainly from adjustments in dividend expectations. Moreover, the stock market's reaction to monetary policy shocks depends on the prevailing interest rate environment. In periods of negative real interest rates, an unexpected tightening of monetary policy results in a decrease in excess stock return. These findings agree with Torrecillas and Jareño (2013), who suggest that the Fisher effect only holds partially and in the long run and that inflationary news can lead to changes in nominal interest rates. Moreover, by considering the Fisher and Phillips curve equations, Gonzalo and Taamouti (2017) demonstrated that a high unemployment rate prompts the Federal Reserve (Fed) to undertake monetary policy actions.

Most recently, a study by Bouzgarrou et al. (2023) analysed the response of G7 financial markets to macroeconomic surprises and uncertainty during the COVID-19 pandemic. They utilized wavelet analysis and the Nonlinear Autoregressive Distributed Lag (NARDL) model proposed by Scotti (2016) to examine the quarterly real GDP, monthly industrial production, employees on non-agricultural payrolls or unemployment rate, monthly retail sales, and a survey of the manufacturing sector as indicators of macroeconomic surprises and uncertainty (news). The results of their research indicate a heightened sensitivity of G7 stock markets to macroeconomic surprises and uncertainty, with the impact being more pronounced in the long term compared to the short term.

2.2.2 Evidence from Emerging Markets Data

In a study conducted by Cakan and Gupta (2017), South Africa's stock market response to US inflation and unemployment news was investigated using the GJR-GARCH (1,1) model. The dataset used in this research consisted of daily stock price indexes denominated in South African Rands for the period spanning from May 1, 1994, to March 8, 2016. The results showed that South African stock market volatility increased in response to positive US inflation news and negative unemployment news. Conversely, volatility decreased in response to positive US unemployment news. In another study by Robinson, Glean and Moore (2018), the stock prices of the top ten green firms in emerging markets were examined to determine how they react to news events. The data used in this research was collected from January 1, 2020 to December 31, 2015, and covered Brazil, India, China, Mexico, South Africa and Taiwan. Using the event study approach, the authors found that green firms' stock market returns tend to be highly reactive to news events in the short term. However, these findings also suggest that the returns associated with green firms are more influenced by long-term factors rather than immediate news events.

In a study conducted by Gupta and Reid (2013), it was found that unexpected changes in the Consumer Price Index (CPI) had a significant impact on stock returns, both at the market level and within various sectors. The research revealed that CPI surprises resulted in a substantial decrease in stock returns during the second month following the shock. Additionally, the impulse response function of the Bayesian VAR analysis indicated that stock returns remained negative for the entire 12-month period. In a separate study, Tripathi and Kumar (2015) examined the relationship

between inflation and stock returns in the BRICS markets using panel data from March 2000 to September 2013. The results showed that the stock index negatively reacted to the inflation rate in Russia, while a significantly positive relationship was observed in India and China.

The research conducted by Balcilar, Cakan and Gupta (2017) examined the influence of inflation and unemployment news from the United States on seven emerging Asian stock markets, including India, Indonesia, South Korea, the Philippines, Singapore, Taiwan, and Thailand, between 1994 and 2014. They utilised the nonparametric causality-in-quantiles test to determine the effects of US news on the returns and volatility of these stock markets. The study results indicated that US news had an impact on all seven stock markets, with these effects particularly pronounced during periods of bearish or bullish markets. To draw accurate conclusions, the researchers emphasised the importance of incorporating nonlinearity in modelling and analysing the entire conditional distribution of stock returns and volatility. In a separate study, Gupta and Modise (2013) used a predictive regression model to examine the out-of-sample predictability of the inflation rate in the South African stock market and found evidence supporting this predictability.

Akyildirim, Ekinci and Corbet (2019) examined the dynamic influence of US macroeconomic news releases on Turkish stock markets, utilising fifty-two variables, such as inflation and unemployment news. The data used was from 2010 and comprised information on 112 stocks categorised into six groups. They employed an efficient t-test approach to compare outcomes across all variables and draw general conclusions about the overall market. The primary finding was that the stock market reacts negatively five minutes after new releases, and investors reduce their trading activity before and after the first five-minute interval after the release. Francis, Ravinthirakumaran and Ganeshamoorthy (2021) investigated the causal relationship between stock prices and macroeconomic variables, such as industrial production, inflation rate, money supply, real exchange rate, trade openness, average weighted prime lending rate, all-share price index, and war data, on the dynamics of stock price movements in the Sri Lankan stock market. Using the autoregressive distributed lag bound test approach with data from January 2007 to December 2019, this study revealed a significant relationship between stock market returns and macroeconomic and political stability variables, excluding the overall share price index.

The research conducted by Viale, Giannetti and Garcia-Feijoó (2020) examined the stock market's response to macroeconomic news in the presence of ambiguity. Ambiguity refers to the notion that investors make decisions based on multiple hypotheses regarding the potential impact of macroeconomic announcements on the stock market. Using an econometric model based on relative entropy, the findings indicate that the stock market reacts more strongly to bad macroeconomic news than good macroeconomic news. Ağirman, Karcıoğlu and Osman (2018) conducted a separate study to investigate the stock market's response to unemployment news in thirty-five Organisation for Economic Co-operation and Development (OECD) countries using panel data analysis between 2008 and 2017. The findings of this research indicated that there is no Granger causal relationship between unemployment and stock markets. In other words, the relationship between the two variables is unidirectional, with the stock market determining unemployment in the long run, but not the other way around.

Nijam, Ismail and Musthafa's (2015) research explored the relationship between macroeconomic variables and the performance of the Sri Lankan stock market. The study employed various econometric models, including ordinary least squares (OLS), linear regression, and Durbin-

Watson statistics. The data collected spanned the period from 1980 to 2012. The results demonstrated a significant causal relationship between the macroeconomic variables and stock market performance. The primary focus of the authors' study was on gross domestic product, inflation represented by the wholesale price index, interest rate, balance of payments, and exchange rate. On the other hand, Tiwari et al. (2015) conducted an extensive examination of the connection between stock prices and inflation in Pakistan using wavelet phase angle and wavelet coherency techniques, concluding that inflation does not have a substantial impact on the estimation of stock prices in Pakistan. Therefore, stocks may hedge against inflation in the long run.

According to Ikizlerlia, Holmes and Anderson's (2020) research on the various responses of investor types to macroeconomic news, investors have distinct reactions to different shocks and respond differently to the same news. Their study, which utilised data from Korea, the US, and Japan for over a dozen years related to real economic activity, including unexpected components relating to inflation, GDP, and unemployment, found that investor responses also vary across different market states. Yuanyuan et al. (2023) also explored the stock market's response to daily positive, negative, and international news coverage in China and Pakistan. By employing quintile analysis, ordinary least squares (OLS), and vector autoregressive (VAR) models on data obtained from the Bloomberg database between January 2025 and December 2019, the authors discovered that investors respond swiftly and significantly to positive news. Consequently, they are willing to pay higher prices for the same stock in response to an increase in positive news, resulting in an overall increase in stock market returns. On the other hand, investors do not respond with the same enthusiasm to an increase in negative news.

2.2.4 Conclusion

A comprehensive study was conducted by Nikkinen et al. (2006) to assess the degree of global stock market integration in response to US macroeconomic news announcements. The results indicated that while countries such as Latin America and transition economies do not appear to be influenced by US news, the G7, European, and Asian countries exhibit a high degree of integration regarding the impact of US macroeconomic news. Despite extensive literature exploring the relationship between macroeconomic news and stock market reactions, empirical evidence remains inconclusive. Prior research has produced diverse findings, so there is no consensus among researchers, investors, and policymakers regarding how stock markets react to inflation and unemployment news. Furthermore, much of the empirical research has focused on the US and developed economies. Therefore, it is imperative to conduct further studies using new data and considering emerging markets to address this knowledge gap (Bhowmik et al., 2022).

Several studies have demonstrated the impact of stock market reactions to macroeconomic news announcements. However, this study enhances the existing body of literature by employing inflation and unemployment news as independent variables and utilising a substantial equity market dataset. Furthermore, this study offers a comprehensive examination of the reaction of equity prices to inflation and unemployment news at both the aggregate and industry levels in South Africa. These equity prices hold great significance as they have the potential to influence investors' activities. This study provides essential insights for researchers and policymakers to understand the interplay of variables under investigation in a wide range of industries. The ensuing section establishes the contextual framework of the study methodology, laying the groundwork for

rigorous analysis and comprehensive research findings. Table 1 illustrates studies on stock market responses to macroeconomic variables across various countries.

Table 1: Previous studies on equity/stock market reaction to macroeconomic news

Author/Year	Country or Countries	Period	Methodology	Variables	Conclusion
Fama (1981)	USA	1953 - 1977	Regression analysis	Real GNP, industrial production, money supply, lagged inflation, capital expenditures and interest rates.	A strong positive relationship between common stock returns and real economic variables.
Chen et al. (1986)	USA	January 1953 to November 1983	Regression analysis	Consumption, the market index, oil prices, industrial production, inflation, interest rate and changes in risk premium.	Industrial production, changes in risk premiums and interest rates are highly significant. Unanticipated inflation and changes in expected inflation are also significant.
Boyd, Hu and Jagannathan (2005)	USA	February 1957 to December 2000	Regression analysis	Unemployment news	On average, in times of economic expansion, stock market values react positively to news of a rising unemployment rate. Conversely, during economic contractions, stock market values react negatively to such news.

Cakan (2012)	USA	January 1981 to December 2005	Regression analysis	Unemployment news Inflation news	Unemployment news does not have a significant impact on US stock market returns. Stock and bond market returns react negatively during expansions, and inflation news affects both.
Jareño, Tolentino and Torrecillas (2018).	USA	January 1990 and April 2013	Event study methodology	Consumer Price Index (CPI) and the Producer Price Index (PPI)	Sector returns demonstrate a strong reaction to CPI announcements while showing no reaction to PPI announcements. Furthermore, inflation announcements appear to impact when the economy is experiencing a downturn and the direction of news is negative. Consequently, the condition of the economy and the direction of surprises are crucial factors in analysing the impact of inflation news on abnormal returns.
Francis, Ravinthirakumaran and	Sri Lanka	January 2007 to December 2017.	ARDL bounds test	industrial production, inflation rate, money supply, real exchange rate, trade openness, the	The results indicate a significant relationship between stock market returns and macroeconomic and

Ganeshamoorthy (2021)				average weighted prime lending rate, all share price index, and war data	political stability variables, except for the overall share price index.
Tapa et al. (2016)	South Africa	1994:Q1 to 2016:Q1	Symmetric and asymmetric cointegration models	Unemployment rate	Reject the notion that unemployment is a good predictor of stock market returns. The findings of the same study show that developments in the stock market do not impact the unemployment rate.
Niu and Zhang (2021)	USA	1964 to 2019	Fixed effects regression	inflation, producer price index and unemployment news	The stock market experiences notably lower returns on days following the announcement.
Tripathi and Kumar (2015)	Brazil, Russia, India, China and South Africa	March 2000 to September 2013	Panel Cointegration Test	Inflation rate	The stock index significantly reacts negatively to the inflation rate in Russia, while a significantly positive relationship is observed for India and China.
Gonzalo and Taamouti (2017)	USA	January 1950 to September 2014	Nonparametric Granger causality and quantile	Unemployment rate	Only the anticipated unemployment rate has a significant influence on stock prices.

			regression-based tests,		
Ağirman, Karcıoğlu and Osman (2018)	Thirty-five Organisation for Economic Co-operation and Development (OCED) countries	2008 and 2017	Panel Data analysis	Unemployment rate	Unemployment does not have a granger cause relationship with the stock market. The direction of the causality is unidirectional between variables. In the long run, the stock market is the determining factor for unemployment but not the other way around.

3 Research Methodology and Data

3.1 Methodology

The findings from existing literature imply that the reaction to unexpected changes in inflation and unemployment depends on the direction of the news and the state of the economy. This study postulates that the equity prices in South Africa will exhibit distinct reactions to inflation and unemployment news, depending on whether the surprises are positive or negative. Specifically, positive surprises (often perceived as "bad news" in the literature, where actual inflation and unemployment exceed expected levels) and negative surprises (typically seen as "good news," where actual inflation and unemployment are lower than expected) are considered. Furthermore, the current state of the economy is also considered to provide further insight into this relationship. The methodology used in this study is primarily centred on the concept of market efficiency.

The study by Boyd, Hu and Jagannathan (2005) used a linear regression model to assess the stock market's response to inflation and unemployment news. This study defined news as the difference between actual and expected announcement values. It was demonstrated that within the sample, there was an adequate representation of positive and negative news events across various economic environments. The price reaction to these distinct economic conditions was examined by combining news, economic environment, and monthly equity data in South Africa. The key distinction between this study and the one conducted by Boyd, Hu and Jagannathan (2005) is that the latter only utilised data from the United States and only examined the stock market's response to unemployment news.

According to Boyd, Hu, and Jagannathan (2005), their research indicates that an increase in unemployment is generally perceived as good news for stocks during economic expansion. In contrast, it is viewed as bad news during economic contractions. The empirical evidence suggests that the business cycle of an economy, in conjunction with macroeconomic announcements, impacts stock market returns. Our analysis is similar to that of Boyd, Hu and Jagannathan (2005), as we distinguish between two states of the economy: recession and expansion. By differentiating the economic environment, we can better understand market reactions. Diaz and Jareno (2009) found a statistically significant and positive increase in stock returns when "bad news" indicates a higher total inflation rate than expected during a recessionary period. Furthermore, they observed a positive stock returns reaction when there are negative surprises in inflation ("good news") during non-recessionary periods.

3.1.1 Measure of Equity Returns and Surprise

Calculating the changes in equity prices is crucial before measuring the impact of macroeconomic news announcements on South Africa using this dataset. As the equity market and industries vary in size, number, and composition, this study computes the change between the closing prices at the end of the current day and the closing equity prices of the previous day. Daily composite equity returns are defined as the logarithmic difference between the daily equity prices. Thus;

$$R_t = 100 \times log\left(\frac{S_t}{S_{t-1}}\right) \quad (2)$$

Where R_t denotes the specific equity returns at announcement day t given as a percentage., S_t and S_{t-1}denote the closing equity prices at the end of the current day and the previous day, respectively. Following the market efficiency theory, equity prices are expected to react only to the unexpected components of macroeconomic news releases. Consequently, we focus on announcement surprises, calculated as the difference between the change in news announcements' actual and expected values. The data are used to gather evidence on whether actual news announcements differ from expected news announcements.

In line with the approach outlined by Gardner, Scotti and Vega (2022), we computed the unexpected components of the announcements by determining the standardised differences between the actual values of the announcements and their respective median expected values. However, the difference between actual announcements and survey forecasts does not adequately capture the extent to which macroeconomic announcements contain new information. Therefore, we standardise surprises by dividing them by their sample standard deviation. Standardised surprise enables us to compare the size of the regression coefficients across various announcements to facilitate interpretation. We measure the standardised surprise as follows:

$$STDEVNEWS_{i,t} = \frac{A_{i,t} - F_{i,t}}{\sigma_i} \tag{3}$$

Where $F_{i,t}$ denotes the median expected values of the forecast survey or expectations from Bloomberg and Datastream of announcement i on day t, $A_{i,t}$ is the released (actual) value of news announcement i on day t, $STDEVNEWS_{i,t}$ denotes the standardised surprise of announcement i on day t, and $\sigma_{i,}$ is the standard deviation (computed from actual (A) and forecasted (F) values) across the sample period of announcement i. Since the σ_i (sample standard deviation) is constant across all observations for a given announcement i; this adjustment does not affect the significance of the estimates or the goodness of fit of the regression (Ikizlerli, Holmes and Anderson, 2019; Gardner, Scotti and Vega, 2022).

This computation facilitates the alignment of the news component of macroeconomic variables with their respective release dates, allowing for matching these dates with the equity returns dates. Daily returns were recorded alongside the macroeconomic announcement dates. Subsequently, irrelevant dates were excluded until each return date corresponded to an announcement date. We use standardised surprises to compare the responses to different macroeconomic announcements. By employing standardised measures, variations due to different frequencies among different variables can be eliminated. Consequently, standardised inflation and unemployment news were used in this study's empirical analysis. These two news announcements were released on different dates and contained distinct information. This approach enables the measurement of the significance of the impact of these news items on stock markets (Chan, Chhagan and Marsden, 2017).

3.1.2 The Regression Equation

It has been argued that modelling stock market reactions to macroeconomic news should allow for the incorporation of the business cycle. Following Boyd, Hu and Jagannathan (2005) and Cakan

(2012), concerning this study, we investigated the response of the equity returns to unemployment and inflation news depending on the state of the economy, using the following linear regression:

$$R_t = \alpha + b_1 \cdot BCI_t \cdot STDEVNEWS_{i,t} + b_2 \cdot (1 - BCI_t) \cdot STDEVNEWS_{i,t} + u_t \qquad (4)$$

Where R_t represents the returns on day t; BCI_t represents the business recession and expansion months as binary dummies, respectively (this study will be constrained to only two distinct periods of the business cycle.). In this context, we use the value of 0 to represent an expansion phase and the value of 1 to represent a contraction phase; $STDEVNEWS_{i,t}$ represents the standardised surprise of announcement i on day t (i is unemployment rate or inflation news); b_1 and b_2 represent the extent of the equity prices' response to inflation or unemployment news during economic contractions and expansions, respectively. Specifically, b_1 quantifies the sensitivity of equity prices to inflation or unemployment news when the economy is in a contraction phase, while b_2 measures the sensitivity during the expansion phase. u_t indicates the error term and is normally distributed with a mean of zero.

3.2 Data

This section describes the data used to analyse the empirical characteristics of the model used in this study. The focus is on the variables of interest and the corresponding data used to represent these variables. The dependent variable is equity returns, which is explained by macroeconomic surprises. Here, we provide an overview of the data that will be used, along with their statistical characteristics. The explanatory variables, macroeconomic surprises, are then explained, including the details of the forecasts and announcements used to calculate surprises and examine their statistical characteristics. Finally, the section concludes with an outline of the business cycle, which is used to account for equity price reactions.

This study used a dataset of daily equity prices denominated in Rands on the JSE in South Africa. The JSE employs an Industry Classification Benchmark (ICB) methodology to classify the companies. We used the daily closing prices of the JSE All Share Index (J203): J510 for Basic Materials, J520 for Industrials, J530 for Consumer Goods, J540 for Health Care, J550 for Consumer Services, J560 for Telecommunications, J580 for Financials, and J590 for Technology. The research sample period spanned from March 2000 to April 2020. This period was chosen based on the availability of the data. In total, 5059 observations were used in this study. The data was from Bloomberg, and monthly equity returns were calculated as the log difference of the daily closing equity prices.

The analysis considered two important scheduled macroeconomic announcements: inflation and unemployment rates, which are among the most significant factors influencing financial assets (Nikkinen and Sahlström, 2004). This study's monthly inflation and quarterly unemployment announcements covered March 2000 to April 2020 and June 2001 to April 2020, respectively. During this period, 254 inflation and 63 unemployment announcements were made. In addition to these two variables, the business cycle indicator of South Africa sourced from the South African Reserve Bank (SARB) website was also included in the data. The dataset covered the period from March 2000 to April 2020, with 242 observed months. Expansion and contraction were based on

the SARB dating of business cycle turning points. There were 72 contraction months and 170 expansion months.

The macroeconomic data used in this study comprised inflation expectations from Bloomberg and unemployment expectations from DataStream. The actual results for monthly inflation and unemployment news are sourced from Bloomberg. Actual data were compared with market expectations or forecasts to calculate "surprises" in macroeconomic announcements. We can interpret "bad economic news" as higher than expected unemployment or inflation (actual macroeconomic news is greater than expected), which is considered bad for the economy. However, good inflation and unemployment news can be understood as lower-than-expected unemployment or inflation (actual macroeconomic news is less than expected), viewed as positive for the economy. Table 2 displays the various industries and the equity market. These assets were analysed individually and separately to examine whether the impact of inflation and unemployment news differs across the aggregate and industry levels.

Table 2: Description of JSE All Share Index and ICB Industries and Data Sources

Equity Market/Industry	JSE Equity Index Codes	Source of Data	Frequency	Availability Date
JSE All Share Index	J203	Bloomberg	Daily	March 2000 – April 2020
Basic Materials	J510	Bloomberg	Daily	March 2000 – April 2020
Industrials	J520	Bloomberg	Daily	March 2000 – April 2020
Consumer Goods	J530	Bloomberg	Daily	March 2000 – April 2020
Health Care	J540	Bloomberg	Daily	March 2000 – April 2020
Consumer Services	J550	Bloomberg	Daily	March 2000 – April 2020
Telecommunications	J560	Bloomberg	Daily	March 2000 – April 2020
Financials	J580	Bloomberg	Daily	March 2000 – April 2020
Technology	J590	Bloomberg	Daily	March 2000 – April 2020

3.2.1 Inflation and Employment News

This study evaluated the equity prices' reaction to announcements of inflation and unemployment rates at both aggregate and industry levels. As discussed by Boyd, Hu and Jagannathan (2005) discussed, the unemployment rate is frequently used as the reference point of Federal Reserve policy and is subject to speculation by investors. This directly relates to the state of the economy. Additionally, the release of these data has a long time series, with information available on both the revisions and release dates. Using the same announcement types, our study in the South African context enhances comparability with the findings of Boyd, Hu and Jagannathan (2005). The equity prices' reaction to the inflation rate is highly probable. As previously mentioned, the interest rate

and inflation play a crucial role in determining the purchasing power of individuals in the future. However, in the event of a high inflation rate during a particular period, purchasing power will likely diminish. Under such circumstances, companies may experience reduced sales of their products or services, leading to decreased profit. This could result in lower or even more negative equity returns.

The unemployment rate was used because it is considered a vital measure for assessing both the state of the economy and the financial markets. Unemployment figures are commonly believed to provide information on the strength of economic growth and potential future inflation. Consequently, the labour market is of significant importance in the reaction function of central banks. A lower unemployment rate increases the likelihood of an interest rate increase, particularly when the economy is growing above this trend. Each month, the release of the unemployment rate represents a crucial news event, closely watched and frequently commented on by central banks responsible for setting interest rates (Ağirman, Karcıoğlu and Osman, 2018).

Moreover, the equity prices' reaction to unemployment news will likely be direct. The unemployment rate has a negative correlation with the interest rate. Interest rates tend to decrease when unemployment rates are high to bolster economic strength. A lower interest rate enables firms to borrow money at a lower cost, facilitating expansion. Consequently, firms are expected to increase their hiring, resulting in a lower unemployment rate (Blanchard, 2013). Banks are likely to provide more loans following a period of elevated unemployment. Conversely, loan activities may decrease during periods of lower unemployment. Additionally, analysing the stock market reaction to unemployment rate data during periods of economic expansion and recession could validate the earlier assertion made by Boyd, Hu and Jaganathan (2005).

3.2.2 Business Cycle Definitions

According to Boyd, Hu and Jaganathan (2005), the stock's reaction to inflation and unemployment news is influenced by both the level of activity growth and its rate of change. According to the United States National Bureau of Economic Research (NBER), a recession is a recurring period characterised by a decline in total output, income, employment, and trade, typically lasting between six months and one year. During these periods, widespread contractions occurred across various sectors of the economy (Jareño, Tolentino and Torrecillas, 2018). In this study, SARB's three composite business cycle indicators (leading, coincident, and lagging movements in the business cycle) were used to determine the upward (expansion) and downward (recession) phases. These indicators encompass all pertinent economic activities across different sectors: production, sales, employment, wage and price trends, monetary aggregates, and investments (Venter, 2019).

This empirical research focused solely on data from the contraction (upward phase) and expansion (downward phase) periods to examine the state of South Africa as a moderating variable. Although this study considers only two different business cycle periods, the above model is appropriate for investigating equity prices' response to macroeconomic news. A dummy variable was included in this study to account for the business cycles in South Africa. In this study, the dummy variable takes a value of 0 to indicate expansion and a value of 1 to indicate recession (Boyd, Hu and Jaganathan, 2005; Gardner, Scotti and Vega, 2022). Figure 3 displays South Africa's business cycle phases since 1945.

Table 3: Business cycle phases of South Africa since 1945

Upward phase	Duration in months	Downward phase	Duration in months
Post-war period: July 1946	7	August 1946 – April 1947	9
May 1947 – November 1948	19	December 1948 – February 1950	15
March 1950 – December 1951	22	January 1952 – March 1953	15
April 1953 – April 1955	25	May 1955 – September 1956	17
October 1956 – January 1958	16	February 1958 – March 1959	14
April 1959 – April 1960	13	May 1960 – August 1961	16
September 1961 – April 1965	44	May 1965 – December 1965	8
January 1966 – May 1967	17	June 1967 – December 1967	7
January 1966 – May 1967	36	January 1971 – August 1972	20
September 1972 – August 1974	24	September 1974 – December 1977	40
January 1978 – August 1981	44	September 1981 – March 1983	19
April 1983 – June 1984	15	July 1984 – March 1986	21
April 1986 – February 1989	35	March 1989 – May 1993	51
June 1993 – November 1996	42	December 1996 – August 1999	33
September 1999 – November 2007	99	December 2007 – August 2009	21
September 2009 – November 2013	51	December 2013 – April 2017	41
May 2017 – June 2019	26	July 2019 – April 2020	10
May 2020 –			

Source: South Africa Reserve Bank

In Table 3, a downward trend indicates a recession period and an upward trend indicates an expansion period. Based on the information provided, it can be deduced, for example, that an expansion began in May 2017 and concluded in June 2019, followed by a relatively short recession (contraction) period from July 2019 to April 2020.

4 Empirical results

In this section, we present the main empirical findings of our study and contextualise them within the existing body of research. We explain the observed outcomes and commence by presenting summary statistics and characterising macroeconomic news. Subsequently, we delve into the outcomes of our investigation of economic news announcements and their potential impact on South Africa's equity prices. Our analysis includes a comprehensive examination of the results, alongside comparisons with the hypotheses presented in the theoretical background of the thesis. Our initial focus is on assessing the statistical significance of the impact of various macro-releases on equity prices, with particular attention paid to the unexpected components within each release. We will objectively report the findings, presenting observations on each research question.

4.1 Descriptive Statistics

Before presenting the empirical results, we will present the summary statistics returns for both the JSE All Share Index and eight industries and macroeconomic news data.

4.1.1 Equity Market and Industry Returns

Table 4: Descriptive statistics for equity market and industry returns

	Daily returns (%)				
	Observations	**Mean**	**Maximum**	**Minimum**	**Std. Dev.**
JSE All Share Index	5059	0,03	7,26	-10,23	1,22
Basic Materials	5059	0,03	12,09	-15,66	1,77
Industrials	5059	0,03	6,98	-11,44	1,19
Consumer Goods	5059	0,04	14,21	-10,04	1,52
Health Care	5059	0,04	6,28	-11,11	1,32
Consumer Services	5059	0,05	7,50	-9,31	1,32
Telecommunications	5059	0,02	19,65	-15,92	2,05
Financials	5059	0,02	7,15	-13,10	1,28
Technology	5059	-0,01	15,11	-20,80	1,87

Note: The mean signifies the average returns, while the standard deviation indicates the extent of the observations' spread (volatility). A larger spread implies that the observations are more widely distributed (volatile). Consequently, it can be inferred that Telecommunications is the most volatile, while Industrials is the least.

The descriptive statistics for daily returns across equity market and industries returns reveal a range of performance and volatility. On average, J550 had the highest daily return at 0.0489%, while J590 had the lowest average return of -0.0044%. J580 exhibited the highest volatility with the highest maximum daily return of 224.7379% and the lowest minimum return of -221.9372%. In contrast, J520 was the least volatile, demonstrating more stable returns with the lowest minimum returns of -11,4384% and a maximum of 6,9847%.

4.1.2 Graphical Analysis

Figure 1-9 illustrates the returns of the JSE and different industries to gain insight into the development of stock indices. This volatility serves as a potential indicator for the outcomes of this research.

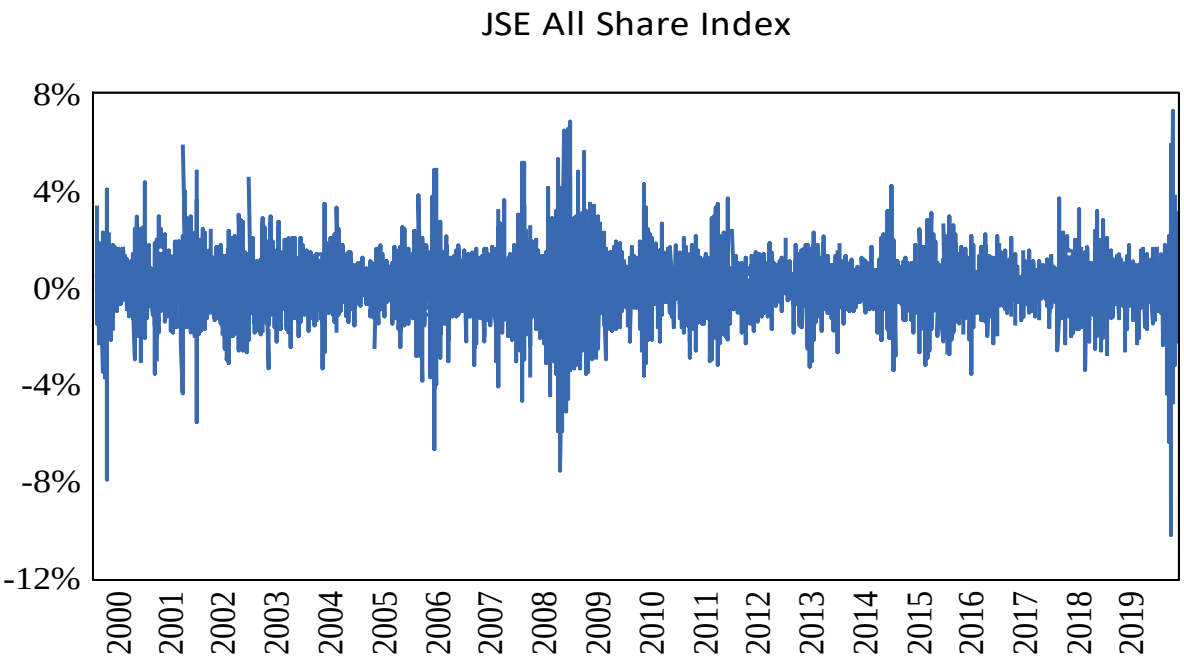

Figure 1: Graphical analysis of returns of JSE All Share Index

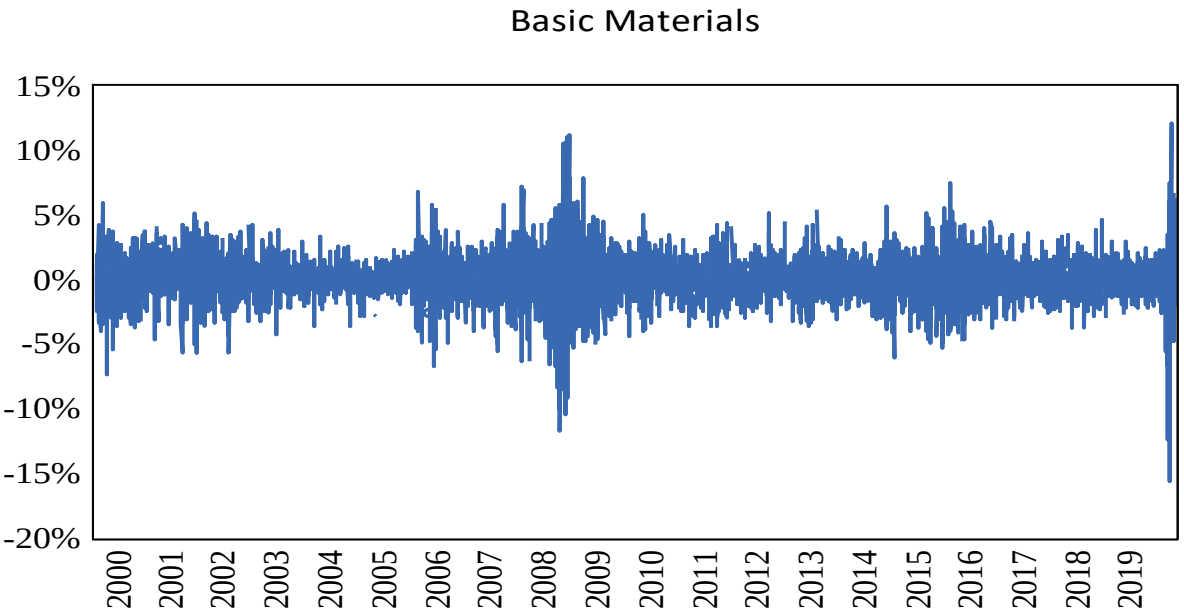

Figure 2: Graphical analysis of returns of Basic Materials

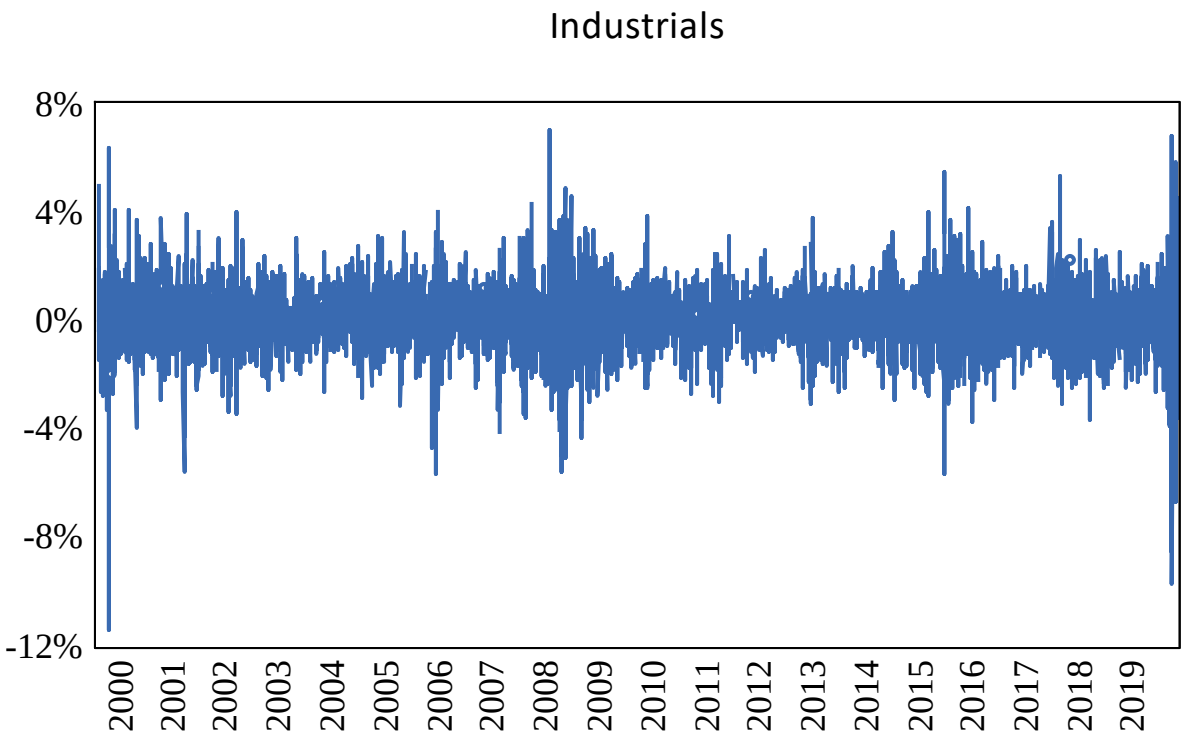

Figure 3: Graphical analysis of returns of Industrials

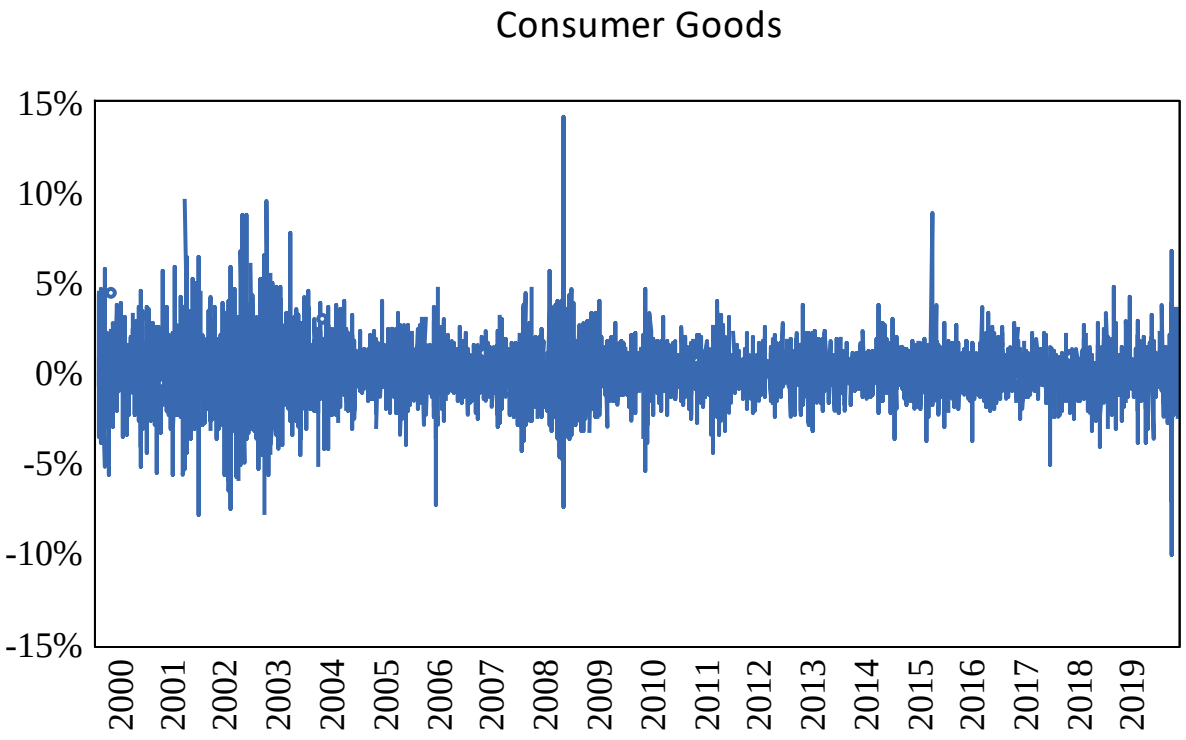

Figure 4: Graphical analysis of returns of Consumer Goods

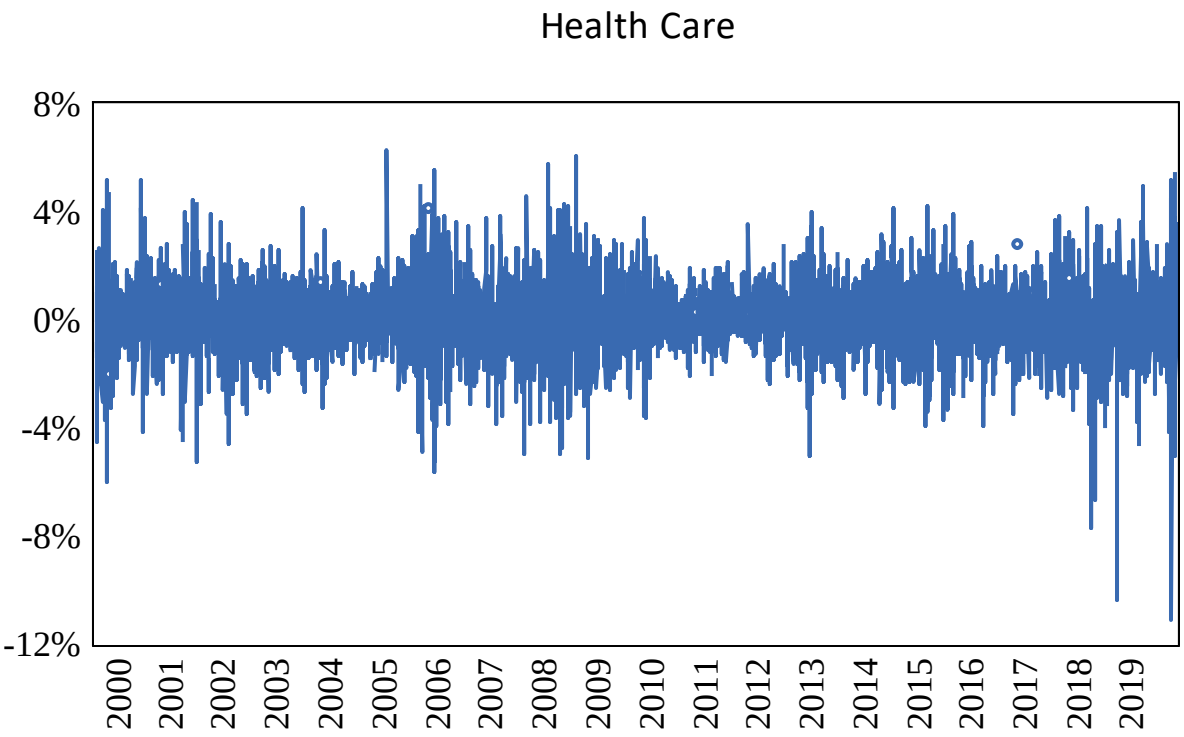

Figure 5: Graphical analysis of returns of Health Care

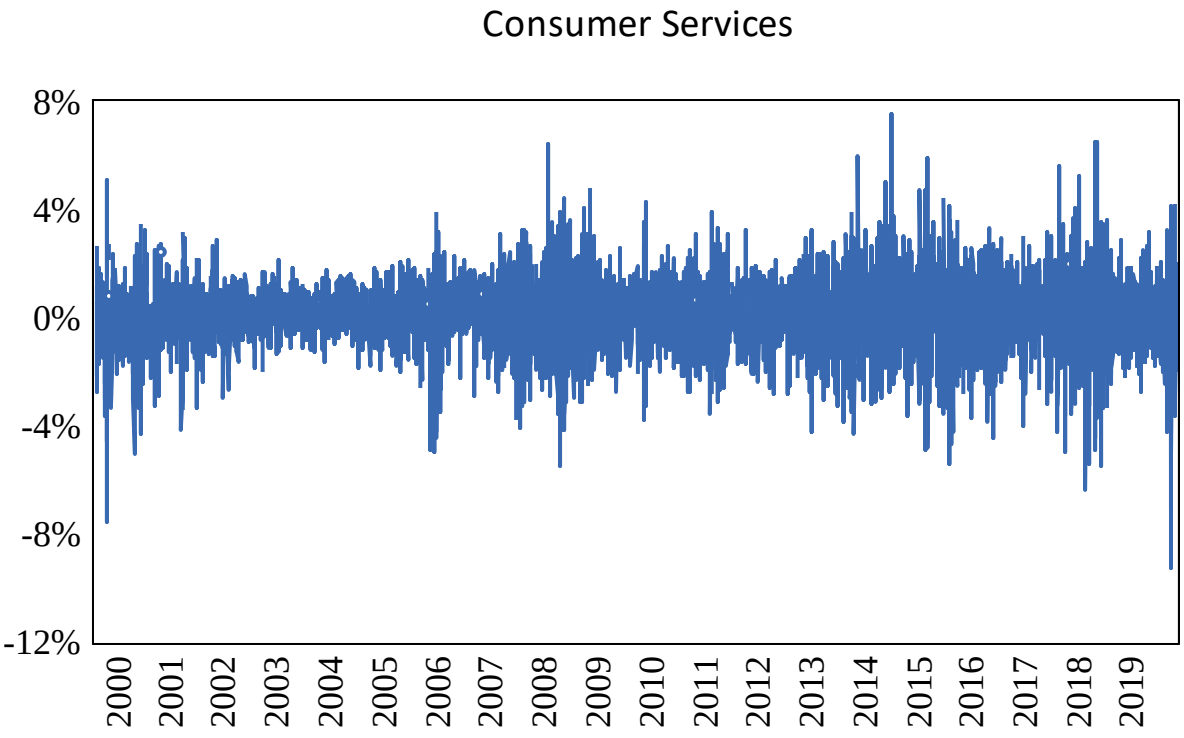

Figure 6: Graphical analysis of returns of Consumer Services

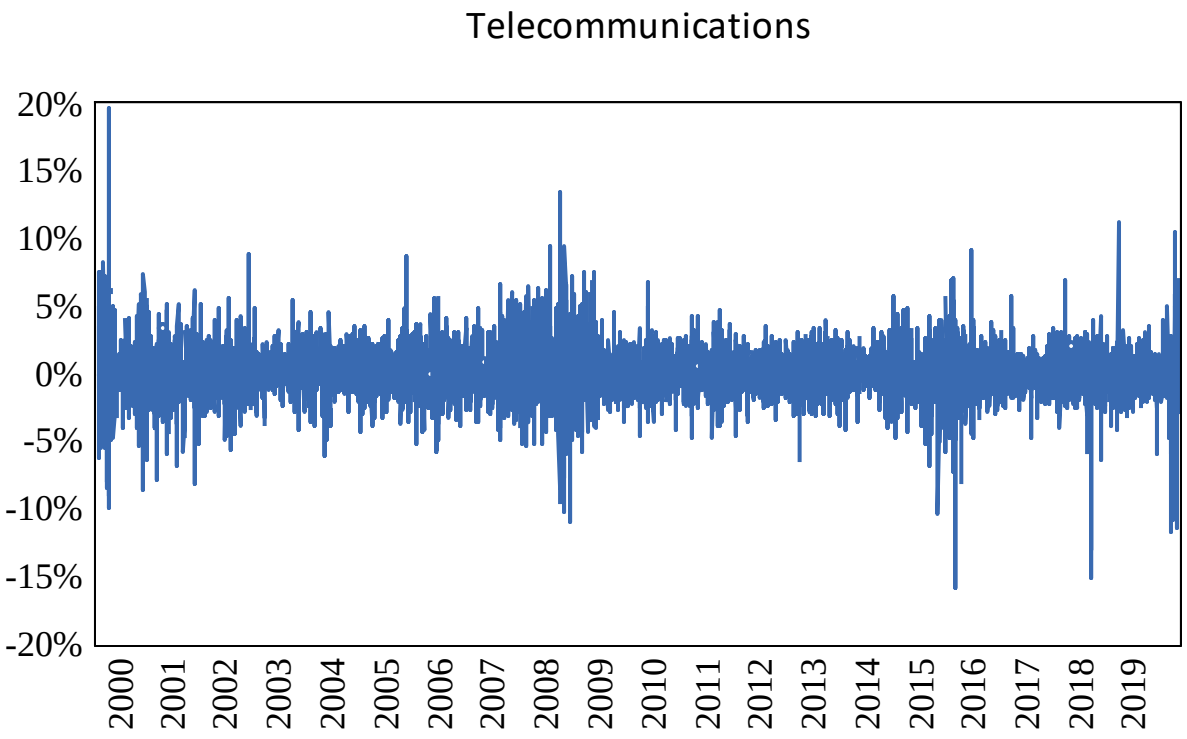

Figure 7: Graphical analysis of returns of Telecommunications

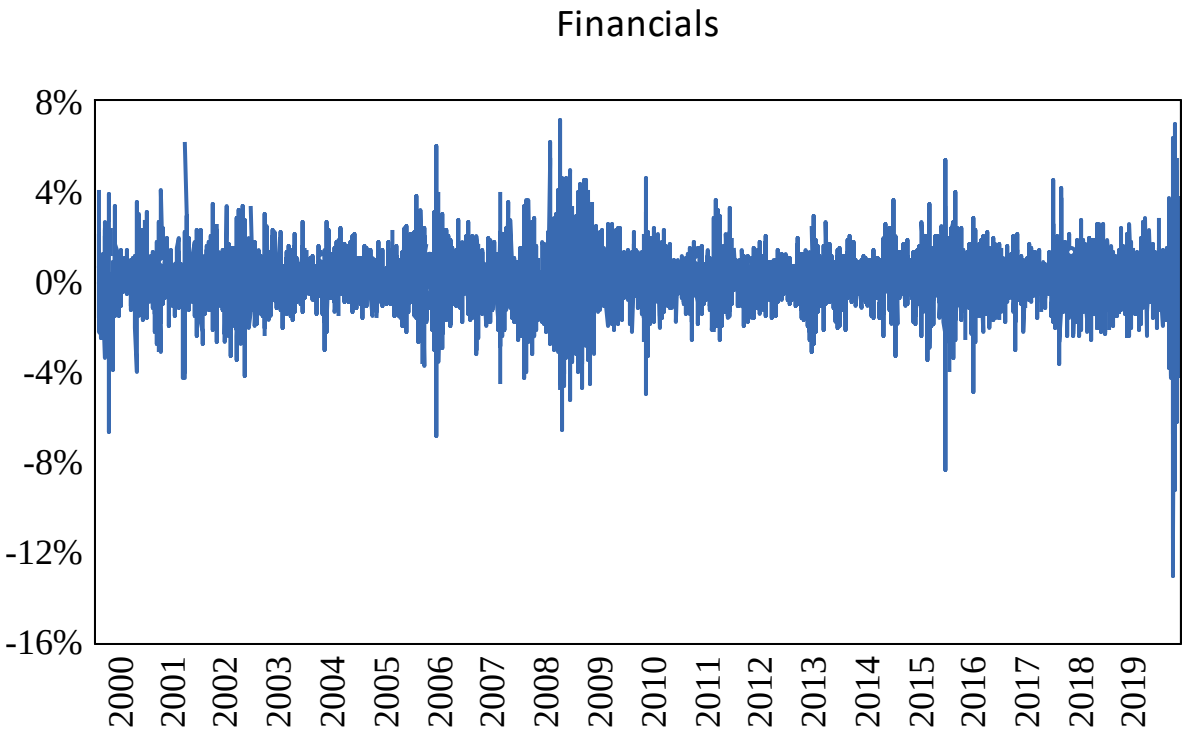

Figure 8: Graphical analysis of returns of Financials

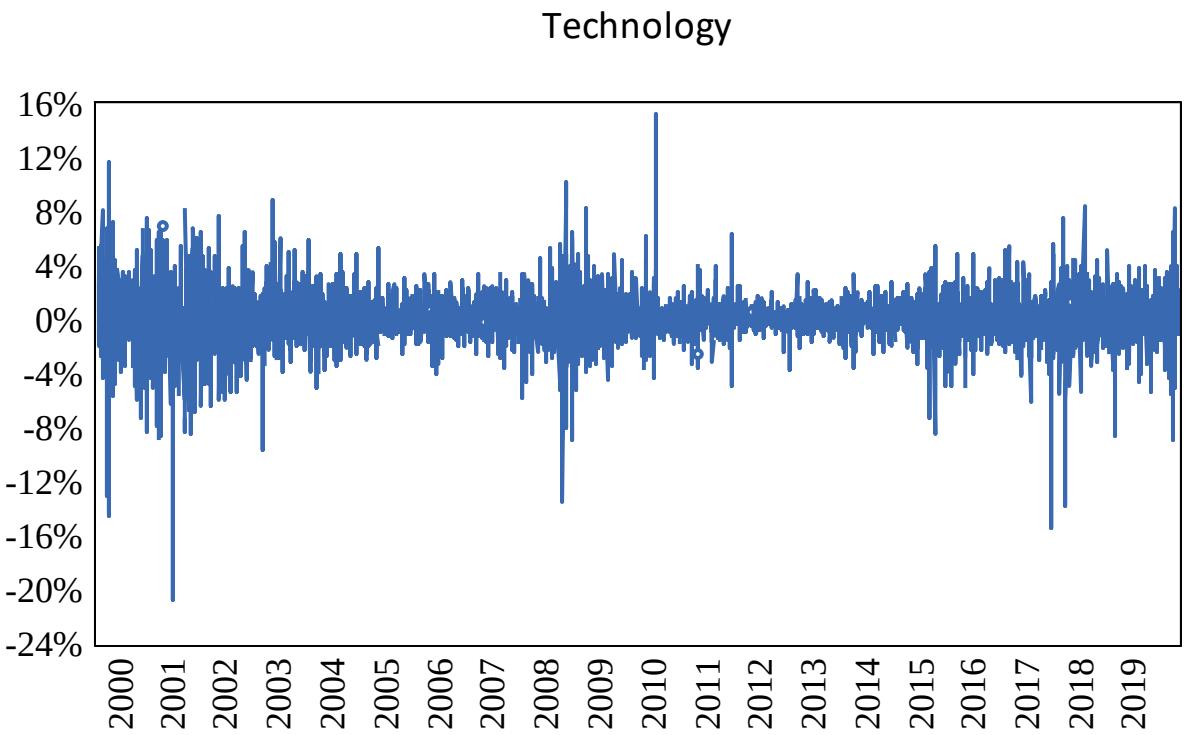

Figure 9: Graphical analysis of returns of Technology

The figures displayed in the graphs represent the returns across the entire sample period from February 2000 to May 2020. The nine assets exhibit a stationary pattern. The data's stationarity suggests that key statistical properties remain constant over time without significant trends or systematic changes. In this context, the graphs portray a consistent and unvarying behaviour of the returns of the nine assets, indicating that the statistical properties of the financial data do not exhibit notable trends during the specified period. This stationary characteristic provides a stable foundation for analysing and understanding the returns, allowing for a more reliable assessment of the underlying patterns and trends in the data.

Among the nine assets, Telecommunications shows the highest volatility, with returns ranging from a minimum change of -15.92 % to a maximum change of 19.65 %. In contrast, Industrials display the smallest volatility, with returns ranging from a minimum change of -11.43 % to a maximum change of 6.98 %. Notably, the mean values for all assets, except Technology, are positive, indicating overall economic growth during the sample period. For instance, Consumer Services registers the highest growth figure, with a mean (μ) of 0.05, based on 5,059 data points representing daily observations of asset returns throughout the sample period. The aim of examining the forthcoming macroeconomic data is to identify the relationship between macroeconomic news and returns during periods of macroeconomic announcements.

4.1.3 Macroeconomic News Data

To grasp the characteristics of the inflation rate, unexpected inflation news, and standardized unexpected inflation news in periods of economic expansions and contractions, we categorized

each month in the sample as either an expansion or contraction month, relying on SARB's reference dating. Table 5 outlines the characteristics of the unemployment rate. In the analysis of 254 monthly actual and forecasted inflation rates, spanning March 2000 to April 2020, the South African economy experienced 172 months of expansion and 72 months of contraction. These periods included three downward and three upward phases. The average inflation rate was higher (6.78%) during contractions and lower (5.30%) during expansions. In theory, according to Phillip's curve, inflation should increase, yet it does not. During economic contractions, demand for goods and services tends to decrease due to factors like reduced consumer spending, lower business investments, and higher unemployment rates. As demand falls, businesses may lower their prices to attract customers, leading to lower inflation rates. Conversely, during economic expansions, increased consumer spending and business investments can lead to higher demand, thereby pushing prices upwards and resulting in higher inflation rates.

Central banks often adjust monetary policy in response to economic conditions. During contractions, central banks may implement expansionary monetary policies, such as lowering interest rates or engaging in quantitative easing, to stimulate economic activity. These policies can contribute to higher inflation rates. Conversely, during expansions, central banks may adopt tighter monetary policies to prevent overheating of the economy, which can lead to lower inflation rates. Additionally, people's expectations of future inflation may influence the pace of inflation during contraction (Chmura, 2019). On average, the inflation rate increased by 0.06% per month during contractions and decreased by 0.01% per month during expansions. Importantly, the forecasted changes in inflation rates were equal during expansions and contractions.

Table 5: Properties of the Inflation Rate

	INF (%)	DINF (%)	DINFF (%)	ERRINF (%)	STDEVINF (%)
Whole Sample	5,7295	-0,0071	-0,0066	-0,0004	-0,0012
Contraction	6,7803	0,0606	0,0592	0,0014	0,0053
Expansion	5,2953	-0,0124	-0,0107	-0,0018	-0,0047

Note: INF denotes the inflation rate for the month, DINF denotes the change in the inflation rate, DINFF denotes the change in the forecasted inflation rate, ERRINF represents the surprise of announcement i on day t and STDDEVINF represents the standardised surprise of announcement i on day t.

Each month in the sample was classified as either an expansion or contraction month, using the reference dating provided by the SARB to analyse the characteristics of the unemployment rate. Table 6 presents an overview of the characteristics of the unemployment rate. Analysis of 63 quarterly actual and forecasted unemployment rates from June 2001 to April 2020 revealed that the South African economy experienced 41 quarters of expansion and 22 quarters of contraction. These periods encompassed three downward phases and three upward phases. The unemployment rate was found to be lower, at 25.2% during contractions and 26.2% during expansions. The results contradict economic norms; however, the difference is minimal, at approximately 1%. According to the Phillips Curve theory, an inverse relationship exists between unemployment and inflation rates. Therefore, a low unemployment rate corresponds to a high inflation rate (Chmura, 2019).

On average, the unemployment rate decreased by 0.34% per quarter during contractions and 0.09% per quarter during expansions. It is worth noting that the forecasted changes in unemployment rates were smaller during contractions compared to expansions.

Table 6: Properties of the Unemployment Rate

	UMP (%)	DUMP (%)	DUMPF (%)	ERRUMP (%)	STDEVUMP (%)
Whole sample	25,93	-0,08	-0,11	0,03	0,05
Contraction	25,20	-0,34	-0,41	0,07	0,10
Expansion	26,24	-0,09	-0,13	0,04	0,06

Note: UMP denotes the unemployment rate for the month, DUMP denotes the change in the unemployment rate, DUMPF denotes the change in the forecasted unemployment rate, ERRUMP represents the surprise of announcement i on day t and STDDEVUMP represents the standardised surprise of announcement i on day t.

Table 7: Properties of the Computed Inflation Rate Surprises

	Good News (Actual Inflation less than forecasted)		Bad News (Actual Inflation greater than forecasted)	
	Number of Observations	Means (Standard deviation)	Number of Observations	Means (Standard deviation)
Contractions	43	-0,12 (0,12)	29	0,17 (0,12)
Expansions	113	-0,15 (0,25)	57	0,18 (0,13)

Table 8: Properties of the Computed Unemployment Rate Surprises

	Good News (Actual Unemployment Less Than Forecasted)		Bad News (Actual Unemployment Greater Than Forecasted)	
	Number of Observations	Means (Standard deviation)	Number of Observations	Means (Standard deviation)
Contractions	6	- 0.59 (0.17)	16	0,38 (0,29)
Expansions	9	-0,41 (0,31)	32	1.34 (1.41)

Table 7 outlines the distribution of inflation surprises, categorized based on whether inflation increased due to good and bad news. Among the 242 months, 156 were negative (interpreted as good news), and 86 were positive (interpreted as bad news). Table 8 outlines the distribution of unemployment surprises, categorized based on whether unemployment increased by less or more than forecasted (good and bad news). Out of 63 months, there were 15 negative surprises (interpreted as good news) and 48 positive surprises (interpreted as bad news).

4.2 Good and Bad News during Contraction and Expansion

Table 9: Good and Bad Inflation News during Contractions and Expansions

Contractions				
	Good News		Bad News	
	Mean	Standard Deviation	Mean	Standard Deviation
JSE All Share Index	0,21	1,37	-0,21	1,95
Basic Materials	0,35	2,32	-0,26	2,59
Industrials	0,11	1,30	-0,15	1,67
Consumer Goods	0,09	1,22	-0,05	1,45
Health Care	0,16	1,52	0,17	1,76
Consumer services	0,08	1,77	-0,06	1,94
Telecommunications	-0,08	1,56	-0,50	3,10
Financials	0,19	1,15	-0,25	2,94
Technology	0,40	2,26	-0,17	1,86
Expansions				
	Good News		Bad News	
	Mean	Standard Deviation	Mean	Standard Deviation
JSE All Share Index	0,05	1,15	0,23	1,00
Basic Materials	-0,07	1,53	0,25	1,47
Industrials	0,24	1,01	0,42	1,28
Consumer Goods	0,09	1,62	0,13	1,63
Health Care	0,09	1,20	-0,04	1,26
Consumer services	0,10	1,20	0,33	1,16
Telecommunications	0,01	1,67	0,76	3,07
Financials	0,15	0,99	0,35	1,09
Technology	0,07	1,67	0,16	2,34

Table 9 shows that during economic contractions, the average stock returns for the JSE All Share Index are 0.21% for good inflation news and -0.20% for bad inflation news. Good inflation news has a positive effect on the JSE All Share Index, and bad inflation news has a negative effect on the JSE All Share Index during contraction. In contrast, during economic expansions, the average

stock returns are 0.05% for good news and 0.23% for bad inflation news. Notably, good inflation news positively impacts the JSE All Share Index in both contractions and expansions. In contrast, bad inflation news has a negative impact on contractions and a positive impact on expansions. In periods of economic contractions, average returns for all industries respond positively to good inflation news, except for Telecommunications. However, all average returns, except for Health Care, respond negatively to bad inflation news. All average returns react positively to good inflation news during economic expansions, except for Basic Materials. Moreover, all average returns, except for Health Care, respond positively to bad inflation news.

Table 10: Good and Bad Unemployment News during Contraction and Expansion

Contraction				
	Good News		Bad News	
	Mean	Standard Deviation	Mean	Standard Deviation
JSE All Share Index	0,39	1,42	0,13	1,10
Basic Materials	1,21	2,63	-0,50	2,01
Industrials	-0,29	1,03	0,09	1,43
Consumer Goods	0,24	1,43	0,37	1,52
Health Care	0,50	1,68	0,34	1,38
Consumer services	-0,59	0,96	0,29	1,20
Telecommunications	-0,01	1,44	0,37	3,01
Financials	-0,01	1,63	0,41	1,67
Technology	0,46	1,03	0,03	1,24
Expansion				
	Good News		Bad News	
	Mean	Standard Deviation	Mean	Standard Deviation
JSE All Share Index	0,12	1,14	0,00	1,49
Basic Materials	0,32	1,44	-0,28	1,61
Industrials	-0,15	1,17	0,10	0,66
Consumer Goods	0,13	1,19	-0,05	2,35
Health Care	0,01	1,28	0,08	1,24
Consumer services	0,21	1,61	0,06	1,21
Telecommunications	0,78	1,46	0,35	1,56
Financials	0,00	1,34	0,18	1,44
Technology	-0,15	3,70	0,24	1,96

Table 10 shows that, during periods of economic contractions, the average stock returns for the JSE All Share Index show a consistent directional trend in response to both unemployment good and bad unemployment news, amounting to 0.39% and 0.13%, respectively. This suggests a certain level of sensitivity of the JSE All Share Index to economic conditions, regardless of the positive

or negative nature of the unemployment news. Intriguingly, both good and bad unemployment news positively affects the JSE All Share Index in both contraction and expansion periods.

In the context of industries, during economic contractions, the average returns for Basic Materials, Consumer Goods, Health Care, and Technology show positive reactions to good unemployment news. At the same time, Industrials, Consumer Services, Telecommunications, and Financials exhibit negative responses. All average returns respond positively to bad unemployment news, except for Basic Materials. In contrast, during economic expansions, the average returns for Basic Materials, Consumer Goods, Health Care, Technology, and Financials demonstrate positive reactions to good unemployment news, while Industrials and Technology respond negatively. Furthermore, during economic expansions, the average returns for Industrials, Health Care, Consumer Services, Telecommunications, Financials, and Technology show positive responses to bad unemployment news. At the same time, Basic Materials and Consumer Goods respond negatively.

4.3 Responses of Equity Prices to Inflation News

Table 11: Inflation news and daily equity returns.

Model	$R_t = \alpha + b_1 \cdot BCI_t \cdot STDEVNEWS_{i,t} + b_2 \cdot (1\text{-}BCI_t) \cdot STDEVNEWS_{i,t} + u_t$				
i	α	b_1	b_2	R^2	**Observations**
JSE All Share Index	0,09 (1,14)	-0,51* (-1,89)	0,03 (0,39)	0,03	241
Basic Materials	0,05 (0,41)	-0,71* (-1,90)	0,04 (0,45)	0,03	241
Industrials	0,21*** (2,50)	-0,20 (-0,68)	0,07 (0,78)	0,01	241
Consumer Goods	0,08 (0,83)	-0,33* (-1,78)	-0,19** (-2,16)	0,02	241
Health Care	0,08 (0,91)	-0,35 (-1,59)	0,08 (1,07)	0,01	241
Consumer services	0,14* (1,74)	-0,29 (-0,97)	0,10 (1,47)	0,01	241
Telecommunications	0,12 (0,81)	-0,54 (-1,47)	0,32 (1,62)	0,03	241
Financials	0,16 (1,55)	-0,51* (-1,86)	-0,00 (-0,03)	0,02	241
Technology	0,13 (0,95)	-0,69 ** (-2,12)	-0,03 (0,86)	0,02	241

Note: The symbols *, **, and *** represent significance levels of 10%, 5%, and 1%, respectively. b_1 and b_2 represent the extent of the responses of equity prices to inflation or unemployment news during economic contractions and expansions, respectively. α represents the intercept term or the constant term in the regression equation.

To address the first research question outlined in Chapter 1, it is crucial to acknowledge the presence of heteroskedasticity and autocorrelation in the residuals of the regressions discussed in this study, as well as in most other regressions (Boyd, Hu and Jagannathan, 2005). As a result, consistent standard errors and t-statistics that account for heteroskedasticity and autocorrelation were calculated using the HAC option to correct for the presence of these issues in the residuals of the regressions presented in this research (Brooks, 2019). This section of the study employs a linear regression model to examine the impact of inflation news on equity prices at both the aggregate and industrial levels. Specifically, Table 11 demonstrates that inflation news has a significant and negative effect on the stock returns of the JSE All Share Index and the Basic Materials, Consumer Goods, Financials, and Technology sectors during economic contractions. Moreover, the White t-statistics are provided in parentheses to show the significance of the impact. It is worth noting that inflation news also has a significant and negative impact on the stock returns of the Consumer Goods sector during economic expansions.

4.4 Responses of Equity Prices to Unemployment News

Table 12: Unemployment news and daily equity returns.

Model	$R_t = \alpha + b_1 \cdot BCI_t \cdot STDEVNEWS_{i,t} + b_2 \cdot (1\text{-}BCI_t) \cdot STDEVNEWS_{i,t} + u_t$				
i	**α**	**b_1**	**b_2**	**R^2**	**Observations**
JSE All Share Index	0,09 (0,53)	-0,34 (-1,48)	-0,44 * (-2,53)	0,10	62
Basic Materials	-0,15 (-0,72)	-0,93** (-2,04)	-0,54** (-2,02)	0,14	62
Industrials	0,00 (0,12)	-0,14 (-0,44)	-0,30*** (-2,74)	0,07	62
Consumer Goods	0,12 (0,62)	-0,13 (-0,35)	-0,35* (-2,18)	0,02	62
Health Care	0,18 (0,86)	-0,48** (-2,20)	0,01 (0,06)	0,04	62
Consumer services	0,07 (0,41)	0,02 (0,08)	-0,40** (-2,58)	0,07	62
Telecommunications	0,39 (1,51)	-0,22 (-1,02)	-0,33 (-1,49)	0,02	62
Financials	0,19 (1,07)	-0,15 (-0,48)	-0,52*** (-3,25)	0,09	62
Technology	0,21 (0,83)	-0,19 (-0,68)	-0,33 (-1,52)	0,02	62

Note: The symbols *, **, and *** represent significance levels of 10%, 5%, and 1%, respectively. b_1 and b_2 represent the extent of the responses of equity prices to inflation or unemployment news during economic contractions and expansions, respectively; α represents the intercept term or the constant term in the regression equation.

Table 12 assesses the influence of unemployment news on equity prices at both aggregate and industrial levels using a linear regression model. The corresponding White t-statistics are presented in parentheses. The results indicate that unemployment news exerts a significant and negative impact on the stock returns of the JSE All Share Index and Consumer Goods during economic expansions. Additionally, unemployment news is found to have a significant and negative impact on the stock returns of Basic Materials during both contractions and expansions. Unemployment news also has a significant and negative impact on the stock returns of Industrials during expansions and significantly negatively affects the stock returns of Health Care during contractions. Furthermore, unemployment news is found to impact the stock returns of Consumer Services significantly and negatively during expansions. Finally, the stock returns of Financials are found to respond negatively to unemployment news during expansions.

4.5 Responses of Equity Prices to Inflation and Unemployment News

Table 13: Inflation and unemployment news and daily returns

News	**i**	***a***	b_1	b_2	R^2
INF	JSE All Share Index	0,09	-0,51*	0,03	0,03
UMP	JSE All Share Index	0,09	-0,34	-0,44 *	0,10
INF	Basic Materials	0,05	-0,71*	0,04	0,03
UMP	Basic Materials	-0,15	-0,93**	-0,54**	0,14
INF	Industrials	0,21***	-0,20	0,07	0,01
UMP	Industrials	0,00	-0,14	-0,30***	0,14
INF	Consumer Goods	0,08	-0,33*	-0,19**	0,02
UMP	Consumer Goods	0,12	-0,13	-0,35*	0,07
INF	Health Care	0,08	-0,35	0,08	0,01
UMP	Health Care	0,18	-0,48**	0,01	0,04
INF	Consumer services	0,14*	-0,29	0,10	0,01
UMP	Consumer services	0,07	0,02	-0,40**	0,07
INF	Telecommunications	0,12	-0,54	0,32	0,03
UMP	Telecommunications	0,39	-0,22	-0,33	0,02
INF	Financials	0,16	-0,51*	0,00	0,02
UMP	Financials	0,19	-0,15	-0,52***	0,09
INF	Technology	0,13	-0,69**	-0,03	0,02
UMP	Technology	0,21	-0,19	-0,33	0,02

Note: The symbols *, **, and *** represent significance levels of 10%, 5%, and 1%, respectively. b_1 and b_2 represent the extent of the responses of equity prices to inflation or unemployment news during economic contractions and expansions, respectively; α represents the intercept term or the constant term in the regression equation.

In addressing the third research question, the current section investigates the influence of macroeconomic news, specifically related to inflation or unemployment, on the response of equity prices. The results presented in Table 13 indicate that inflation news has a more detrimental effect

on the JSE All Share Index compared to unemployment news during economic expansions. However, unemployment news significantly impacts the JSE All Share Index during expansions more than inflation news. The JSE All Share Index analysis also reveals that, based on the available data, neither inflation nor unemployment news demonstrates statistically significant coefficients during expansions and contractions, respectively. The absence of significant coefficients suggests that the observed fluctuations in the equity market response cannot be reliably associated with inflation or unemployment news during expansions and contractions.

The influence of unemployment news appears to be greater than inflation news on Basic Materials returns during economic expansion. This is supported by the statistical significance of the coefficients for unemployment news during contractions and expansions, indicating a substantial impact on Basic Materials' response during these periods. In contrast, the coefficients for inflation news are less significant in both economic phases. It is also observed that unemployment news has a more significant impact on the returns of Industrials, Consumer Services, and Financials during economic expansion than inflation news. This is evidenced by the statistically significant coefficients associated with unemployment news during expansionary periods, suggesting a substantial impact on the responses of Industrials, Consumer Services, and Financials in such periods.

The influence of unemployment news on Health Care returns appears to be more pronounced during economic contractions than inflation news. This is demonstrated by the statistically significant coefficient attributed to unemployment news during economic contractions, which indicates a substantial impact on Health Care's response in these periods. Conversely, inflation news seems to have a more significant impact on Technology returns during economic contractions than unemployment news. This is corroborated by the statistically significant coefficient associated with inflation news during economic contractions, which suggests a substantial influence on Technology's response in these periods.

4.6 Discussion of Results

This research study is grounded in the Efficient Market Hypothesis (EMH), which posits that stock prices are influenced by macroeconomic news. According to the theory, the prices of individual firms' equity are impacted by economic conditions, as these conditions affect the anticipated future earnings and dividends of these firms. The relationship between expected future earnings, dividends, and share prices is established through the required rate of return. A well-functioning financial system swiftly incorporates crucial macroeconomic information into equity prices and returns. Therefore, the study assumes that expectations regarding such news are unbiased. Following Fama's influential work in 1970, the market is expected to exhibit "semi-strong form" efficiency, meaning that all publicly available information, including macroeconomic news, should be rapidly reflected in stock prices. Tables 7-10 provide a comprehensive reference for the analysis by outlining various characteristics of macroeconomic news.

The study demonstrates that good inflation news positively impacts the JSE All Share Index during both economic contractions and expansions. In contrast, negative inflation news has a negative impact during contractions. In addition, good inflation news positively affects the JSE All Share Index during expansions, while bad inflation news has a positive effect during expansions. In terms of industries, all average returns respond positively to good inflation news during economic

contractions, except for Telecommunications. Conversely, all average returns, except for Health Care, respond negatively to bad inflation news during contractions. During economic expansions, all average returns react positively to good inflation news, except for Basic Materials, and all average returns respond positively to bad inflation news, except for Health Care. Overall, both good and bad news positively impacts both contraction and expansion periods. This finding is consistent with Du's (2018) study, which examined market reactions to good and bad news announcements from the Japanese government, Japanese central bank, and international credit rating agencies from 2010 to 2016, and found that the market reacted more strongly to good news than to bad news.

Gardner, Scotti, and Vega (2022) investigated the relationship between the communication practices of Central banks in the United States and the equity price responses to macroeconomic announcements. This research aligns with our study, emphasising the relevance of the prevailing economic environment in shaping the stock market's reactions. These findings are consistent with Jareño, Tolentino and Torrecillas (2018), whose analysis indicates a significant reaction of sector returns to CPI announcements, contrasting with no observable reaction to PPI announcements. It is also noteworthy that the influence of inflation announcements is more pronounced during times of economic downturn and when the news direction is negative. As a result, the state of the economy and the direction of surprises are critical factors to consider when examining the effect of inflation news on abnormal returns.

Similarly, Gurgul, Mitterer and Wójtowicz (2020) utilised the event study methodology to investigate the influence of macroeconomic news on the US economy, specifically focusing on 13 stock prices listed on the Vienna Stock Exchange (VSE). Their examination of the effects of unexpected good and bad news revealed a significant stock price reaction, particularly in response to positive news. Yuanyuan et al. (2023) explored how the stock markets in China and Pakistan respond to daily positive, negative, and international news coverage. They observed that investors promptly and significantly respond to positive news. An increase in positive news is associated with higher stock prices, resulting in an overall rise in stock market returns. On the other hand, this study suggests that investors do not display a corresponding level of enthusiasm in response to an increase in negative news.

The findings indicate that the coefficients for the JSE All Share Index and other industries lack statistical significance in some economic phases, rendering them inconclusive and of little use. This is consistent with the results of Tiwari et al. (2015), who thoroughly examined the relationship between stock prices and inflation in Pakistan using wavelet phase angle and wavelet coherency techniques. They concluded that inflation does not significantly impact the estimation of stock prices in Pakistan. However, the results suggest that stocks might serve as a hedge against inflation in the long run. In contrast, Gupta and Reid (2013) found that news in the CPI significantly impacts stock returns in South Africa, both at the overall market level and across various sectors. They discovered that CPI shocks led to a substantial decrease in stock returns during the second month following the shock. These findings indicate that the effect of inflation news on stock returns yields mixed results.

5 Conclusion

This study investigated the response of equity prices to inflation and unemployment news in South Africa, using both aggregate and industry-level data during business cycles. The study employed the linear regression model proposed by Boyd, Hu and Jagannathan (2005) to provide evidence. The investigation is consistent with the market efficiency hypothesis, which posits that stock prices reflect all available information about equity prices. As a result, only unexpected news has the potential to impact stock price returns. The study categorised the characteristics of inflation and unemployment rates, unexpected inflation and unemployment news, and standardised unexpected inflation and unemployment news each month based on SARB's reference dating, distinguishing between expansion and contraction months in periods of economic growth and contraction.

Utilising the acquired data, we initially evaluated the time-series characteristics of stock data. Employing OLS regression, we investigated the proposed relationships' statistical significance. We calculated heteroskedasticity and autocorrelation-consistent standard errors and t-statistics using the heteroscedasticity and autocorrelation-consistent (HAC) method to address potential biases. This approach was implemented to mitigate the impact of both heteroskedasticity and autocorrelation in the residuals of the regressions presented in the study.

According to the data, positive news about inflation has a favourable impact on the JSE All Share Index, while negative news about inflation has an unfavourable impact. Specifically, during periods of economic contraction, good inflation news positively affects the index, while bad inflation news has a negative effect. Similarly, during periods of economic expansion, good inflation news has a positive impact on the index, while bad inflation news has a negative impact. When it comes to industries, all average returns respond positively to good inflation news during economic contractions, except for Telecommunications. On the other hand, all average returns respond negatively to bad inflation news during economic contractions, except for Health Care. All average returns react positively to good inflation news during economic expansions, except for Basic Materials. Additionally, all average returns, except for Health Care, respond positively to bad news during economic expansions.

Good and bad unemployment news positively affect the JSE All Share Index in contraction and expansion periods. In the context of industries, during economic contractions, the average returns for Basic Materials, Consumer Goods, Health Care, and Technology display a positive reaction to good unemployment news, while Industrials, Consumer Services, Telecommunications, and Financials exhibit a negative response. Notably, all average returns react positively to bad unemployment news, except for Basic Materials. On the other hand, during economic expansions, the average returns for Basic Materials, Consumer Goods, Health Care, Technology, and Financials display a positive reaction to good unemployment news, while Industrials and Technology respond negatively. In addition, during economic expansions, the average returns for Industrials, Health Care, Consumer Services, Telecommunications, Financials, and Technology show a positive response to bad unemployment news. At the same time, Basic Materials and Consumer Goods respond negatively.

In examining the response of equity prices to inflation news, the regression analysis indicates that inflation news negatively impacts the stock returns of the JSE All Share Index and the Basic Materials, Consumer Goods, Financials, and Technology during economic contractions. Conversely, inflation news negatively impacts the Consumer Goods industry's stock returns during economic expansions. When considering the influence of unemployment news on equity prices, the regression analysis results reveal a negative effect on the returns of the JSE All Share Index and Consumer Goods during economic expansions. For Basic Materials, unemployment news negatively affects equity returns during contractions and expansions. In Health Care, unemployment news has a negative impact on equity returns, specifically during contractions. Moreover, the equity returns of the Financials, Industrials, and Consumer Services respond negatively to unemployment news during economic expansions. These findings regarding unemployment news are contrary to those obtained by Boyd, Hu, and Jagannathan (2005).

Finally, while examining which macroeconomic news, whether related to inflation or unemployment, has the most significant impact on the response of equity prices, the evidence suggests that inflation news negatively impacts the JSE All Share Index the most compared to unemployment news during expansions. However, during expansions, unemployment news significantly negatively impacts the JSE All Share Index compared to inflation news. Unemployment news affects Basic Materials returns more significantly than inflation news in economic expansions. Similarly, during economic expansions, the impact of unemployment news on Industrial, Consumer Services, and Financial returns is greater compared to inflation news. Unemployment news has a greater impact on Health Care returns during economic contractions compared to inflation news. Inflation news appears to exert a more significant impact on Technology returns during economic contractions compared to unemployment news.

This research utilised macroeconomic announcements, typically disseminated between 10 am and 2 pm on designated announcement days. Additionally, we incorporated closing prices for the same announcement days as equity price data. It is widely acknowledged in various studies that inflation and unemployment news announcements have an impact on equity returns. This notion is supported in our research on equity prices at both the aggregate and industry levels in South Africa. However, it is important to note that other events that may affect the equity market and industry returns may occur between the macroeconomic announcement and the closing equity prices on these days. Therefore, it may be more beneficial to consider factors beyond inflation and unemployment news that influence equity prices to obtain a more accurate understanding of stock fluctuations.

A suggested avenue for future research would be to explore the equity returns of various others compared to a broader selection of sub-sectors. A plausible direction for future research could be to investigate the equity returns of various sectors and sub-sectors in comparison to one another. Furthermore, the limited explanatory power observed in each significant model can be attributed to the inherent volatility of the JSE All Share Index and industries' returns. This volatility arises from the dependence of daily equity returns on many factors, extending beyond the influence of a singular macroeconomic announcement. The research could encompass various types of news, extending beyond macroeconomic indicators to include political or company-specific news. This broader approach would yield a more comprehensive and balanced understanding of the impact

on the emerging stock market. Exploring the volatility of the South African equity market presents an intriguing extension for this research. Utilising the GARCH model allows for an examination of how news announcements influence the equity market's volatility.

6 Policy recommendations

In South Africa, where the JSE All Share Index reacts positively to good inflation news and negatively to bad inflation news during contractions, policymakers can continue strengthening inflation monitoring and communication to provide transparent and timely information. Encouraging economic diversification and resilience, particularly in industries impacted by inflation fluctuations, is crucial. Tailoring industry-specific policies, promoting investor education, and maintaining policy flexibility to adapt to changing economic conditions are essential strategies. Providing targeted support for industries resilient to inflation, such as Health Care, and addressing barriers to growth in industries negatively affected, such as Basic Materials, is recommended. Additionally, strategies for mitigating the negative impact of inflation on the Telecommunications industry during contractions and fostering collaboration between regulatory bodies and industry stakeholders are vital for overall economic stability.

In the South African context, where both good and bad unemployment news positively affects the JSE All Share Index in both contraction and expansion periods, policymakers should consider the nuanced impact on different industries. Strengthening economic resilience during contractions is crucial, with a focus on industries like Basic Materials, Consumer Goods, Health Care, and Technology that exhibit positive reactions to good unemployment news. Addressing negative responses in industries like Industrials, Consumer Services, Telecommunications, and Financials during contractions requires tailored interventions. During expansions, strategies to sustain positive responses in Basic Materials, Consumer Goods, Health Care, and Technology to good unemployment news and managing negative reactions in Industrials and Technology become essential. Policymakers should also note the diverse industry responses to bad unemployment news, emphasizing the need for targeted policies to mitigate potential negative impacts on industries like Basic Materials and Consumer Goods.

In response to the sensitivity of equity prices to inflation news, policymakers could consider a multifaceted approach. Firstly, promoting economic diversification is essential, particularly in industries like Basic Materials, Financials, Consumer Goods, and Technology, which exhibit significant negative impacts during economic contractions. Secondly, implementing risk mitigation strategies and developing hedging mechanisms can safeguard against inflation-related challenges. Additionally, industry-specific policies tailored to vulnerable industries may include targeted incentives or regulatory adjustments. Continuous market monitoring, ensuring timely access to accurate information, is crucial, and a focus on long-term economic planning can build resilience and stability.

Given the response of stock prices to unemployment news, policy recommendations should aim to enhance resilience and minimise potential negative consequences. Strategies to achieve this may include providing targeted support to industries that demonstrate significant vulnerability, such as Basic Materials, Consumer Goods, Industrials, Health Care, and Financials during economic contractions and expansions. Proactive measures, such as training and re-skilling programs, can help address the labour market challenges caused by unemployment news. Policymakers may also consider implementing industry-specific interventions to promote growth and stability. Moreover, tailored policies and incentives may be necessary to support Financials during economic downturns and Consumer Services during periods of expansion. To effectively manage the diverse

effects of inflation and unemployment news across industries and the equity market, it is crucial to implement a flexible policy framework that can adapt to changing circumstances.

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