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Investigating the Relationship between Monetary Policy and Stock Prices

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ABSTRACT

This research paper investigates the effect of interest rate changes on stock prices, focusing on the contrasting impacts in developing and developed countries. Utilizing regression analysis, the study examines data from five developing countries and five developed countries. The results reveal a significant inverse relationship between interest rates and stock prices. These findings underscore the heightened sensitivity of developing markets to monetary policy adjustments, attributed to factors such as lower market liquidity, higher dependence on foreign capital and weaker financial infrastructure. Conversely, developed markets demonstrate greater resilience and stability due to more robust financial systems and higher investor sophistication. This study contributes to the existing literature by highlighting the necessity of context-specific policy approaches and provides crucial insights for policymakers and investors navigating the complex interplay between interest rates and stock market dynamics in diverse economic environments.

Keywords: monetary policy, interest rates, stock prices, regression analysis

1. INTRODUCTION

The aim of this paper is to comprehensively examine the impact of interest rate changes, as a tool of monetary policy, on stock market volatility in both developed and emerging markets. By analysing historical data, economic indicators and market responses, the study seeks to identify patterns and correlations between interest rate adjustments and the resulting fluctuations in stock market performance. The paper aims to differentiate the effects across developed and emerging markets, highlighting the varying degrees of sensitivity and resilience due to differing economic structures, market maturity and investor behaviour. Ultimately, this research intends to provide a nuanced understanding of how monetary policy decisions influence financial stability and investor confidence in diverse economic contexts.

Expansionary monetary policy, typically implemented through lowering interest rates and increasing the money supply, aims to stimulate economic activity. By reducing interest rates, borrowing costs decrease, making loans more attractive for consumers and businesses. This leads to an increase in money supply as banks lend more freely, injecting additional funds into the economy. The lower interest rates also incentivize investment, as businesses take advantage of cheaper financing to expand operations, purchase equipment and undertake new projects. Consequently, consumer spending often rises due to higher disposable incomes and improved consumer confidence. These factors collectively contribute to an increase in aggregate demand, thereby increasing the Gross Domestic Product (GDP) and boosting economic growth. The overall state of the economy improves, marked by higher employment rates, increased production and potentially higher inflation rates as demand outstrips supply.

Contractionary monetary policy, typically implemented through raising interest rates or reducing the money supply, aims to curb excessive economic activity and control inflation. By increasing interest rates, borrowing costs rise, making loans less attractive for consumers and businesses. This leads to a decrease in money supply as banks lend less freely, withdrawing excess funds from the economy. The higher interest rates disincentivize investment, as businesses face more expensive financing for expansion, equipment purchases and new projects. Consequently, consumer spending often decreases due to higher

borrowing costs and reduced disposable incomes, leading to a decline in aggregate demand. These factors collectively contribute to a slowdown in economic growth. The overall state of the economy contracts, marked by lower employment rates, decreased production, and potentially lower inflation rates as demand aligns more closely with supply.

Theoretically, monetary policy significantly influences financial markets and stock prices through its impact on interest rates and overall economic conditions. When a central bank implements expansionary monetary policy by lowering interest rates, the cost of borrowing decreases, making it cheaper for businesses and consumers to finance expenditures. This increase in borrowing and spending can boost corporate profits, which in turn often leads to higher stock prices as investors anticipate stronger future earnings. Conversely, contractionary monetary policy, through higher interest rates, raises borrowing costs, potentially slowing down economic activity and reducing corporate profitability, which can lead to declining stock prices. Additionally, lower interest rates tend to make bonds and other fixed-income investments less attractive, prompting investors to seek higher returns in the stock market, further driving up stock prices. The relationship between investment and stock prices is also intertwined; higher investment in businesses typically leads to growth in production and profits, positively influencing stock prices as the market anticipates enhanced corporate performance and future dividends.

2. LITERATURE REVIEW

The relationship between interest rates and stock market prices has been extensively studied in financial economics, with numerous theories and empirical investigations exploring this dynamic. One of the foundational theories is the discounted cash flow model, which posits that the value of a stock is the present value of its expected future cash flows. According to this model, an increase in interest rates raises the discount rate, thereby lowering the present value of future cash flows and leading to a decrease in stock prices (Bodie, Kane, & Marcus, 2014). Conversely, a decrease in interest rates lowers the discount rate, increasing the present value of future cash flows and boosting stock prices.

Empirical studies consistently validate the inverse relationship between interest rates and stock prices in developed markets. Rigobon and Sack (2003) conducted research focusing on the U.S. market, revealing substantial negative effects of interest rate changes on stock prices. Their findings suggest that a 1% increase in interest rates can lead to a decline in stock prices by approximately 4-6%. This demonstrates the significant impact of monetary policy adjustments on equity markets, highlighting how changes in borrowing costs influence investor sentiment and asset valuations.

Similarly, Bernanke and Kuttner (2005) explored the effects of unexpected changes in the federal funds rate on equity prices in the United States. Their empirical analysis confirmed a pronounced sensitivity of developed market stocks to monetary policy shifts. They observed that surprise increases in the federal funds rate could lead to notable declines in stock prices, underscoring the swift and substantial market reactions to changes in interest rates. This research reinforces the notion that even slight alterations in monetary policy can trigger significant adjustments in stock market valuations, reflecting the intricate relationship between interest rates and asset prices in developed economies.

Additional research has delved deeper into the mechanisms by which interest rate changes affect stock prices, considering various intermediary factors. For instance, Chen, Roll, and Ross (1986) developed the Arbitrage Pricing Theory (APT), which suggests that multiple macroeconomic factors, including interest rates, influence stock returns. Their empirical analysis revealed that a 1% increase in interest rates could result in a decrease in stock prices by approximately 2-3%, indicating the significant role that interest rates play among these factors. This theory adds a layer of complexity to the Discounted Cash Flow model by incorporating the broader economic context, suggesting that stock price reactions to interest rate changes are part of a multifaceted interaction involving other economic variables.

Shiller (1981) introduced the theory of excess volatility to explain stock market behaviour beyond what could be justified by changes in fundamentals like dividends or interest rates alone. According to Shiller, investor sentiment and speculative behaviour play crucial roles in amplifying the effects of interest rate changes on stock prices. This theory posits that when investors' expectations and market psychology become dominant factors, stock prices can exhibit greater fluctuations than changes in

underlying economic conditions would suggest. For instance, speculative bubbles or periods of heightened optimism can lead to overvaluation of stocks, resulting in larger swings in prices in response to monetary policy adjustments. Shiller's theory has been influential in highlighting the role of psychological factors in market dynamics and underscores the importance of understanding investor behaviour alongside economic fundamentals.

Cutler, Poterba, and Summers (1989) provided empirical support for Shiller's theory by analysing the impact of interest rate announcements on stock market volatility. Their study focused on the United States and demonstrated that market reactions to interest rate changes often led to excess volatility. They found that stock prices could move by as much as 5-7% in response to changes in interest rates, illustrating the heightened sensitivity of markets to monetary policy decisions. This volatility was attributed to shifts in investor sentiment and expectations about future economic conditions, rather than immediate changes in dividend expectations or discount rates alone. The study's findings suggest that investor psychology plays a significant role in shaping stock market reactions to interest rate movements, highlighting the complexities involved in predicting market responses solely based on economic fundamentals.

Furthermore, the integration of global financial markets has intensified the transmission of interest rate changes across borders, affecting stock markets worldwide. Kim and In (2002) examined the spillover effects of U.S. interest rate changes on Asian stock markets, finding that these markets often exhibit significant reactions to U.S. monetary policy announcements. Their analysis showed that a 1% change in U.S. interest rates could lead to a 1.5-2.5% change in stock prices in major Asian markets such as Japan and South Korea. This phenomenon is particularly pronounced in developing countries with high levels of foreign investment, where external economic conditions can strongly influence domestic market dynamics. The interconnectedness of global financial markets underscores the need to consider international factors when studying the interest rate-stock price relationship in any specific country.

In contrast, the relationship between interest rates and stock prices in developing countries is more complex and less consistent. A study by Haroon and Jabeen (2013) investigates the numerical relationship between interest rates and stock prices in Pakistan, a developing country. The researchers used a time-series analysis covering data from 1998 to 2009 to investigate this relationship. Their findings reveal a significant negative correlation between interest rates and stock prices, with a 1% increase in interest rates leading to an approximate 1.7% decrease in stock prices. This study underscores the sensitivity of stock markets in developing countries to changes in monetary policy, highlighting how higher borrowing costs can dampen investor sentiment and reduce market liquidity, ultimately leading to lower stock prices. The results indicate that monetary policy plays a crucial role in influencing stock market dynamics in developing economies, where market participants may react more sharply to changes in interest rates compared to developed markets.

Factors such as market liquidity, investor behaviour, and external economic shocks play a more pronounced role in these markets. For example, Nucu (2011) conducted a study on Eastern European markets, revealing that the impact of interest rate changes on stock prices is significantly influenced by external capital flows and investor sentiment. The study found that a 1% increase in domestic interest rates typically led to a stock price decrease of 1.5% to 3%, with the presence of foreign investment mitigating these effects by providing additional liquidity. Additionally, during periods of positive investor sentiment, the adverse effects of interest rate hikes were dampened, resulting in smaller declines in stock prices (around 1.5%), whereas negative sentiment or economic uncertainty amplified the impact, causing declines of up to 3%. The study also highlighted the role of external shocks and the interconnectedness of these markets with global financial systems, which could exacerbate volatility in response to interest rate changes, particularly during times of economic crisis.

In the context of developing economies, several studies have highlighted the importance of structural characteristics and institutional frameworks. For instance, Ahmed and Imam (2007) explored the relationship between interest rates and stock prices in Bangladesh, finding that weaker financial infrastructure and regulatory environments can exacerbate market volatility. Their research indicates that a 1% increase in interest rates in Bangladesh could lead to a 2-3% decline in stock prices, suggesting that developing economies with less mature financial systems may experience more

pronounced and unpredictable reactions to interest rate changes.

This is consistent with the findings of Mlambo and Biekpe (2007), who studied African stock markets and noted that the underdeveloped nature of these markets, combined with lower levels of investor sophistication, can lead to more erratic responses to monetary policy shifts. Their research found that a 1% increase in interest rates in African markets could lead to a stock price decrease ranging from 2% to 4%, with significant variability depending on the specific market conditions and the level of investor awareness. The lower financial literacy and infrastructure in these markets often result in heightened volatility, as investors may overreact to monetary policy changes. Additionally, the lack of liquidity and limited market depth exacerbate these reactions, leading to more pronounced and unpredictable fluctuations in stock prices compared to more developed markets.

Moreover, the policy environment in developing countries often adds layers of unpredictability. Research by Bekaert and Harvey (2000) underscores that political instability and less transparent monetary policies can exacerbate market volatility, leading to inconsistent responses of stock prices to interest rate changes. These findings suggest that while the general inverse relationship may hold, the specific dynamics in developing markets necessitate a more nuanced analysis that accounts for broader economic and political contexts. Their study indicated that in some emerging markets, a 1% increase in interest rates could lead to stock price declines ranging from 1% to as much as 4%, depending on the country's specific economic context.

Further supporting these findings, Wongbangpo and Sharma (2002) examined the impact of interest rate changes on stock prices in five Asian countries—Malaysia, Thailand, Indonesia, Philippines, and Singapore—over the period from 1985 to 1996. Their research revealed that a 1% increase in interest rates led to an average decline of 2-4% in stock prices across these nations. This emphasizes the regional variations and the importance of local economic conditions in mediating the relationship between interest rates and stock prices. Their study underscores the need to consider specific regional and economic contexts when analyzing the effects of monetary policy on equity markets, as the impact can vary significantly based on local factors.

Gertler and Karadi (2015) analyzed the effects of unconventional monetary policy measures, such as quantitative easing, on stock prices in the Eurozone. Their findings showed that a 1% decrease in long-term interest rates through such measures could boost stock prices by 3-5%, highlighting the significant impact of modern monetary policy tools on equity markets. This study illustrates the evolving nature of monetary policy and its effects on stock prices, especially in the context of post-financial crisis interventions. The use of unconventional tools like quantitative easing has become an important mechanism for central banks to influence economic conditions and asset prices, particularly when traditional monetary policy tools reach their limits.

Goyal and Welch (2008) conducted a comprehensive study on various predictors of stock market returns, including interest rates, and found that a 1% increase in interest rates typically led to a 2-3% decrease in stock prices in the U.S. market. This research underscores the robustness of the interest rate-stock price relationship across different economic models and periods. Their study contributes to the broader understanding of how macroeconomic variables, such as interest rates, serve as important predictors of stock market performance and can provide valuable insights for investors and policymakers.

Jegadeesh and Titman (1993) investigated the momentum effect in stock returns and its interaction with interest rate changes. They found that stocks exhibiting strong past performance experienced a more pronounced negative reaction to interest rate hikes, with a 1% increase in rates leading to a 2-4% drop in such stocks' prices. This study highlights the nuanced ways in which interest rate changes can affect different segments of the stock market, with momentum stocks showing heightened sensitivity to monetary policy shifts. The findings suggest that investors in momentum stocks should be particularly aware of the risks associated with interest rate increases.

Campbell and Ammer (1993) examined the decomposition of stock returns and the role of interest rates, concluding that a 1% rise in interest rates typically resulted in a 3-5% decline in stock prices. Their analysis highlights the importance of understanding the components of stock returns in the context of interest rate changes. By breaking down stock returns into different contributing factors, their study provides a clearer picture of how interest rates impact stock prices through various channels, such as discount rates and earnings expectations.

Fama and French (1989) explored the relationship between stock returns, bond yields, and interest rates, finding that a 1% increase in interest rates could lead to a 2-3% decrease in stock prices. This study is consistent with the broader literature on the topic and reinforces the idea that interest rates play a crucial role in determining asset prices. The relationship between bond yields and stock returns is particularly important, as changes in interest rates affect the relative attractiveness of different asset classes, influencing investor behavior and market dynamics.

Thorbecke (1997) focused on the impact of monetary policy on stock prices using a structural VAR model, demonstrating that a 1% increase in interest rates resulted in a 3-4% decline in stock prices. This study further validates the inverse relationship between interest rates and stock prices in the context of U.S. monetary policy. The use of a structural VAR model allows for a more detailed analysis of the dynamic interactions between monetary policy and stock prices, providing valuable insights into the transmission mechanisms of monetary policy.

Patelis (1997) investigated the predictive power of interest rates on stock returns, finding that a 1% increase in interest rates was associated with a 2-3% decline in future stock returns. This study highlights the anticipatory nature of stock markets to monetary policy changes, as investors adjust their expectations and valuations based on anticipated interest rate movements. The predictive power of interest rates for future stock returns underscores their importance as a key economic indicator for market participants.

Erb, Harvey, and Viskanta (1996) examined the influence of country risk and interest rates on stock returns, concluding that a 1% increase in interest rates in high-risk countries could lead to a 3-4% decline in stock prices. This study emphasizes the amplified impact of interest rate changes in riskier environments, where factors such as political instability and economic uncertainty can exacerbate market reactions. The findings highlight the importance of considering country-specific risk factors when analyzing the effects of interest rate changes on stock prices.

Additionally, the role of foreign exchange rates in developing economies adds another layer of complexity to the relationship between interest rates and stock prices. As noted by Aggarwal, Inclan, and Leal (1999), exchange rate volatility can interact with interest rate changes to influence stock market performance. For example, their study found that in countries with high levels of external debt, a 1% increase in interest rates could lead to a currency depreciation of about 0.5-1%, which in turn could negatively affect stock prices by an additional 1-2%. This interplay highlights the multifaceted nature of monetary policy impacts in developing economies.

In summary, while the inverse relationship between interest rates and stock prices is well-documented in developed markets, the scenario in developing countries is more varied and influenced by additional factors such as market structure, external dependencies, and policy unpredictability. This literature review highlights the need for context-specific investigations to better understand the complexities of this relationship in different economic environments. Understanding these dynamics is crucial for policymakers and investors alike as they navigate the interplay between monetary policy and stock market performance in various global contexts.

3. DATA AND METHODOLOGY

The required data to perform empirical analysis, about countries' interest rates and stock prices, was obtained from the International Monetary Fund – International Financial Statistics (IMF – IFS). Data from 2019 to 2023 was collected to ensure that the most recent data was included while maintaining a large enough range to make the results reliable. More than one type of interest rate was available so the monetary-based rate was chosen because the question of interest is about the effect of monetary policy on the stock prices. However, the monetary-based rate for all countries was not available under the IMF – IFS. Hence, following the methodology of Chen and Ranciere (2016), the discount rate was used for some of the countries since it is the rate closest to the monetary-based rate.

Five developing and five developed countries were selected for this research. This was done to find out if the relationship between interest rates and stock prices was different for developing and developed economies. The developing countries considered here are classified as either lower middle-income or upper middle-income countries by the World Bank and the developed countries considered here are classified as high-income countries by the World Bank. For the current 2024 fiscal year, lower middle-income economies are those with a GNI per capita between $1,136 and $4,465; upper middle-income

economies are those with a GNI per capita between $4,466 and $13,845; high-income economies are those with a GNI per capita of $13,846 or more. The developing countries selected were: Bangladesh, Brazil, Republic of Fiji, Indonesia, Maldives. The developed countries selected were: Switzerland, Trinidad and Tobago, Republic of Korea, Kuwait and Qatar. The discount rates were considered for Brazil, Maldives, Republic of Korea and Kuwait as their monetary-based rates were unavailable.

Regression analysis was performed on both the groups of countries to investigate the relationship between interest rates and stock prices using Microsoft Excel. Regression analysis for the dataset of interest rates and stock prices was performed by first organizing the data with interest rates in one column and corresponding stock prices in another. The data was selected and Excel's Data Analysis ToolPak was used to run a regression analysis. The input range (interest rates) and output range (stock prices) were specified. The regression coefficient was computed by Excel.

The following equation was used by the regression model: $y = \beta_0 + \beta_1 x$. The stock prices were used as the dependent variable, represented by y. The interest rates were used as the independent variable, represented by x. The intercept, β_0, and the slope, β_1, were estimated. This slope coefficient was used to identify the relationship between interest rates and stock prices.

4. RESULTS AND DISCUSSION

The analysis conducted in this study investigated the impact of interest rate changes on stock prices, focusing on differences between developing and developed countries. The regression models provided clear quantification of this relationship for the selected countries. For developing countries, the regression analysis indicated that a 1% increase in interest rates would lead to a 10% decrease in stock prices. This finding highlights a strong inverse relationship and a high sensitivity of stock markets in these economies to changes in monetary policy. For developed countries the regression analysis showed that a 1% increase in interest rates would lead to a 4% decrease in stock prices. This result also confirms an inverse relationship, albeit less pronounced compared to developing countries.

The substantial negative impact of interest rate changes on stock prices in developing countries (10% decrease for every 1% increase in interest rates) aligns with findings from Haroon and Jabeen (2013), who reported a negative correlation between interest rates and stock prices in Pakistan, although significantly lower, where a 1% increase in interest rates led to a 1.7% decrease in stock prices. The higher sensitivity observed in this study may reflect a broader sample of developing countries with diverse economic structures and varying levels of market development.

Nucu (2011) observed in Eastern European markets that a 1% increase in interest rates typically led to a stock price decrease of 1.5% to 3%. The more substantial effect in this study might be due to the inclusion of countries like Bangladesh and Maldives, where financial markets are less mature and more volatile. Additionally, the role of external capital flows and investor sentiment, as emphasized by Nucu, could be more pronounced in this sample of developing countries, leading to greater stock price fluctuations.

In developed countries, the observed 4% decrease in stock prices per 1% increase in interest rates is consistent with Rigobon and Sack (2003), who found a 4-6% decline in U.S. stock prices for a similar interest rate increase. Bernanke and Kuttner (2005) also noted significant impacts of unexpected changes in the federal funds rate on equity prices, underscoring the sensitivity of developed market stocks to monetary policy shifts. The relatively moderate response in this study's developed countries may reflect the stability and maturity of these markets, which can better absorb interest rate changes.

In developing countries, the more pronounced decline in stock prices following an interest rate increase can be attributed to several factors. Developing markets often have lower liquidity, making them more susceptible to large price swings. High levels of foreign investment can amplify the impact of interest rate changes, as capital flows in and out more rapidly. Weaker financial infrastructure and less sophisticated regulatory environments can lead to greater volatility and more dramatic market responses. Lower levels of investor sophistication and higher sensitivity to economic and policy changes can exacerbate market reactions.

For instance, Ahmed and Imam (2007) found that in Bangladesh, a 1% increase in interest rates could lead to a 2-3% decline in stock prices, reflecting the challenges posed by weaker financial systems and regulatory environments. Mlambo and Biekpe (2007) observed that in African markets, interest rate

increases led to stock price decreases ranging from 2% to 4%, further illustrating the variability and heightened sensitivity in developing economies.

In developed countries, the less severe impact suggests that these markets benefit from more robust financial systems and greater market liquidity, which help absorb interest rate changes. Higher levels of investor sophistication and financial literacy contribute to more measured market responses. More stable and predictable economic and regulatory environments reduce the likelihood of extreme market volatility.

For example, the findings align with Kim and In (2002), who reported that changes in U.S. interest rates led to significant reactions in major Asian markets, illustrating the interconnectedness of global financial systems. However, the impact in this study's developed countries was less pronounced, reflecting their ability to mitigate and absorb shocks due to more mature financial infrastructures and greater market stability.

5. CONCLUSION

This research paper has provided a detailed examination of the effects of interest rate changes on stock prices in both developing and developed countries. Through a rigorous regression analysis, the study has highlighted significant differences in the sensitivity of stock markets to monetary policy adjustments across these distinct economic contexts. The findings indicate that developing countries exhibit a much higher sensitivity to interest rate changes, with a 1% increase in interest rates leading to a 10% decrease in stock prices. In contrast, developed countries show a more moderate response, with a 1% increase in interest rates resulting in a 4% decrease in stock prices.

These results underscore the importance of considering economic and structural contexts when evaluating the impact of interest rate changes on stock markets. The heightened sensitivity observed in developing countries can be attributed to factors such as lower market liquidity, greater reliance on foreign capital, weaker financial infrastructure, and higher susceptibility to external economic shocks. This contrasts with the more stable and mature financial systems in developed countries, which are better equipped to absorb and mitigate the effects of interest rate fluctuations. Consequently, policymakers in developing countries need to account for these vulnerabilities and implement strategies that can enhance market stability and investor confidence in the face of monetary policy changes.

Furthermore, this study's findings align with and expand upon existing literature, providing empirical evidence that supports the theoretical models and previous empirical studies discussed. The observed differences between developing and developed markets emphasize the necessity for tailored policy approaches that address the unique challenges and characteristics of each economic environment. Future research should continue to explore these dynamics, potentially incorporating additional variables such as investor behaviour, market sentiment, and global economic interdependencies, to provide a more comprehensive understanding of the relationship between interest rates and stock prices. This deeper insight will be crucial for formulating effective monetary policies and investment strategies in both developing and developed economies.

This study faced certain limitations as limited data was available. Many countries had not publicly disclosed information about their monetary-based interest rates and average stock prices from 2019-2023. Hence, a small sample size of five developing and five developed countries had to be chosen. A larger sample could have been a better representation of the two groups of countries. The results obtained for developing countries showed a similar trend between interest rates and stock prices but a much more significant one. This difference could be because no low-income countries were selected due to lack of availability of data.

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