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Quantile-On-Quantile Connectedness between Macroeconomics and Stock Market Return in Vietnam

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Abstract

This paper investigates the impact of macroeconomics on stock market returns using a quantile-on-quantile regression model. With 28,740 quarterly observations from Q1 2004 to Q1 2023, we find that the stock market serves as a safe haven during various macroeconomic conditions but acts as a hedge solely against macroeconomic impacts. These relationships are further influenced by the stock market's bullish, normal, or bearish state. In bullish markets, rising stock prices are accompanied by increased investor optimism, leading to a negative and low slope as risk aversion rises. Conversely, moderate GDP levels and neutral market conditions result in a positive slope, indicating investors' willingness to take risks. Foreign direct investment (FDI) plays a significant role in economic restructuring and government revenue generation, while GDP has a positive impact on the stock market index. In bearish states, money supply expansion 's influence is subdued due to cautious investor sentiment. This study provides valuable insights for investors, enabling better asset prediction and informed decision-making, while also offering guidance to countries with similar economic characteristics in assessing their financial situations and policy adjustments based on macroeconomics' impact on stock market returns.

Keywords: *macroeconomics; GDP; FDI; Monetary Policy; Stock market return; Vietnam; quantile-on-quantile*

JEL Codes: E12, E43, E51, E63, F47

1. Introduction

In the stock market, the rate of return stands as a crucial and indispensable indicator. The determination of the ratio between the profit earned and the total capital spent enables investors to make the most rational decisions and select high-efficiency investment portfolios. Consequently, investors direct their attention to the factors within the stock market when making investment decisions, recognizing that the influence of market factors significantly impacts the economic situation. Through preceding scientific research, the authors have identified the factors affecting returns in the stock market as follows: human factors (Gupta et al., 2022), technology factors (Tseng, 2022; Xiang et al., 2020), environmental, social, and

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governance factors (Kilic et al., 2022); political instability (Gala et al., 2023; Kamal et al., 2023), and pandemics (Guven et al., 2022; Oanh, 2022; Salisu et al., 2020; Xu, 2021).

In Vietnam, the stock market is evolving into a central financing channel for the economy, showcasing notable improvements in its organization. Between 2011 and 2020, funds in the exchange surged, reaching nearly 123.4 million US dollars, almost tenfold compared to 2001-2010. This infusion constituted 19.5% of the average financing capital and gross social product, significantly contributing to the rational restructuring of Vietnam's monetary system. Examining the impact of macroeconomics on stock market returns is crucial for the government to gain a comprehensive understanding and regulate policy instruments effectively, thereby mitigating market shocks. Both domestic and foreign investors, as stockholders, are keen to comprehend how their assets may be influenced by sudden changes in economic factors.

Controlling investor relationships exert a particularly significant influence on the volatility of stock returns, a factor that holds particular importance for Chinese firms operating in liberalized regions. This observation contributes to previous research indicating that market liberalization is associated with an increase in volatility in stock returns (Gupta et al., 2022). The more rapidly new technology is embraced by investors, the greater the stock market return they receive (Tseng, 2022). Environmental, Social, and Governance (ESG) serves as a metric assessing a company's commitment to environmental and social responsibility. Investors posit that engaging in ESG investments can be advantageous for both investors and society. This approach aims to mitigate the adverse effects of business operations on the environment and community while concurrently fostering long-term value for investors (Kilic et al., 2022). The progression of Research and Development (R&D) costs can be viewed as a breakthrough that enhances the products and standing of smaller companies. However, it poses risks for larger companies that have already established stability in their product segments (Xiang et al., 2020).

Countries with a higher rank in political policies tend to yield lower average stock returns compared to their lower-rated counterparts (Gala et al., 2023). Political instability is associated with a negative relationship with stock returns, particularly impacting small and medium enterprises, as evidenced during the Russo-Ukrainian Political War in early 2022 (Kamal et al., 2023). The global spread of diseases and viruses, including pandemics such as MERS, SARS, Ebola, H5N1, H1N1, and most recently, Covid-19, has significantly impacted the overall health of the world economy (Salisu et al., 2020).

This paper aims to analyze and estimate the effect of macroeconomics on the stock market returns of listed companies in the Ho Chi Minh City Stock Exchange (HOSE) and Hanoi Stock Exchange (HNX) from the first quarter of 2004 to the first quarter of 2023. The model incorporates various macroeconomic factors affecting stock market returns, such as money supply, deposit interest rates, foreign direct investment, and local GDP. Consequently, two research questions have been formulated:

RQ1: *To what extent do macroeconomic factors, including money supply, deposit interest rates, foreign direct investment, and local GDP, influence stock market returns?*

RQ2: *What is the specific and direct impact of each individual factor on stock returns?*

This article explores the meaningful influence of macroeconomics on stock market returns through various factors. *Firstly*, Foreign Direct Investment (FDI) plays a crucial role in supplementing domestic capital, fostering rapid and substantial economic development. FDI

enables countries and enterprises to expand project capacity, production, and operations, leading to improved product quality and diversity. *Secondly*, GDP growth stimulates consumer demand for goods, encouraging production and business processes, ultimately enhancing enterprise profits. This heightened economic activity attracts investor attention and capital, thus improving market returns. *Thirdly*, money supply significantly impacts the financial market, evident through monetary policy (MP). Increased loan availability for enterprises stimulates business expansion, bolstering market positions, cash flows, and stock prices. *However*, the interest rate has an inverse effect on stock market returns. When interest rates rise, stock prices tend to fall, and vice versa.

The results of this study aim to contribute to the theoretical and practical significance in Vietnam. *First*, based on the financial situation in Vietnam, the study aims to provide other theoretical bases that contribute academically and theoretically to new findings of macroeconomics on the stock market return. *Second*, in practical terms, the findings will help the State and the government have a deep, thorough insight in policies and rationally adjust policy tools in accordance with the interrelationship of factors affecting each other during the improvement period after the Coronavirus, especially in an increasing sharply in inflation, as well as, avoiding shock to the market. Individual and enterprise investors will have a deeper understanding and attention to the impact of macroeconomic factors on securities investment efficiency and corporate financing.

The paper is structured as follows: Part 1 presents the introduction, Part 2 provides the theoretical background, and Part 3 includes a review of literature and the development of hypotheses. Part 4 presents the research methodology and Part 5 showcases the results and discussion. Finally, Part 6 contains the conclusion, while Part 7 focuses on the theoretical contribution and managerial implications.

2. Theory Background

2.1 Classical Theory of Interest

In the 18th and 19th centuries, the classical theory of interest rates was developed by British economists, then refined by the Austrian economist Bohm Bawerk, and further advanced by Irving Fisher in the early 20th century (Academy et al., 2014; Quarterly & May, 2014). The classical theory of interest rates posits that interest rates are influenced by two factors: the supply of savings and the demand for investment capital. This theory emphasizes the public's savings behavior and the demand for capital investment in production. It is particularly suited for explaining interest rates in the long run as these changes occur gradually. According to the classical interest rate theory, the supply of savings from households, businesses, and governments plays a crucial role in determining interest rates, although it is not the sole determinant. Another vital factor is investment capital demand, primarily driven by enterprises and some governments. Enterprises require substantial funds annually to meet various investment needs, such as expanding production, replacing machinery, and other investments. In this theory, the demand for investment capital has a negative effect on interest rates, implying that high interest rates correspond to low investment capital demand and vice versa. The interplay between the supply of savings and the demand for investment capital ultimately determines interest rates in financial markets. The equilibrium interest rate is established when savings provided in the financial market match investment capital demand.

2.2 Keynesian Economics

The economic theory was proposed by British economist John Maynard Keynes and his followers (Keynes et al., 1936). Keynes believed that governments should use their budgetary power to maintain economic growth and stability, effectively overcoming the recurring cycles of recession experienced by most Western economies. In his work "The General Theory of Employment, Interest, and Money" (Keynes et al., 1936), Keynes argued that governments should play a dynamic role in managing the economy by manipulating tax and spending policies. According to Keynes, deficit spending during periods of weak economic growth stimulates private sector growth. Keynesian economics is considered a "demand-side" theory that focuses on short-term adjustments in the economy, influencing fiscal and monetary policy. Based on Keynes's theory of fiscal stimulus, increasing government spending will lead to more business activity and higher consumption. This theory posits that higher consumption leads to increased total output and income. If people are willing to increase their spending, gross domestic product (GDP) could exceed the government's initial stimulus measures. Keynesian economics, which also influenced monetary policy, prioritizes demand-oriented solutions during economic downturns. Government involvement in economic growth is a central tenet of Keynesian economics, aimed at combating unemployment, underemployment, and low consumer demand. In 1937, one year after the publication of Keynes's "General Theory," John Richard Hicks developed the IS-LM Analysis model, exploring assumptions related to investment, savings, money supply, and demand (Hick, 1937). This model helps determine the equilibrium point of Keynesian reasoning. Between 1939 and 1948, Keynes's close friend Roy Forbes Harrod developed an economic growth explanatory model based on Keynes's theory of income regulation (Harrod, 1939).

2.3 Asymmetric Information Theory

(Akerlof, 1970) introduced the concept of asymmetric information, that argued that sellers with a large amount of internal asset information are unwilling to sell their products to buyers lacking asset information. The buyer believes that if the seller is ready to straighaway sell their assets at the price provided by the buyer, it indicates that the bid is higher than the asset value. The problem of information asymmetry indicates to the undervaluation of asset prices in the market, as buyers and sellers do not have the same level of information. (Cleary, 1999) believes that the reason for market information asymmetry is that external funding donors evaluate investment projects based on their quality and risk. This makes the outside capital cost higher than the inside capital cost as a risk premium. Based on (Akerlof, 1970; Myers & Majluf, 1984) argument about information asymmetry, discussed the problem of adverse selection in investment decisions. All of these studies argue that there is information asymmetry between companies and external investors in imperfect markets. When external investors are unable to distinguish between efficient and inefficient investment opportunities, issuing stocks to raise funds externally is a signal to external investors that investment projects are inefficient. (Ross, 1977) believes that when capital demand increases, excellent companies will mainly rely on borrowing debt. Therefore, when a company supplies new shares, it will send a strong negative signal of corporate quality to the market, which will affect the decline in issuance prices. (Myers & Majluf, 1984) pointed out that it is only possible to add value to existing shareholders after considering the interests of new shareholders. Therefore, many companies accept a reduction in investment in projects with a good net present value to ensure the interests of existing shareholders, rather than issuing new shares for all projects with a good net present value. However, (Myers & Majluf, 1984) also commented that, if an enterprise has strong financial resources, it will never ignore an investment project with positive NPV at all. Asymmetric information theory implies the priority order of fund utilization, as concluded by (MYERS,

1984). (MYERS, 1984) points out that there is a pecking order use of funds, mainly based on information asymmetry. Enterprises prioritize the use of internal funds to avoid reducing investment projects with a good net present value or issuing new shares. The company will implement a dividend policy based on its goal of increasing internal capital while maintaining the highest possible debt ratio to avoid financial difficulties or shortages. This means that the enterprise will make the most of its internal capital and then make short-term debt repayments. When external funds are needed, companies will issue long-term debt securities, and equity issuance is the ultimate source of funding.

3. Literature Review

3.1 GDP Affects Stock Market Return

The research paper by (Kalam, 2020), talks about the positive correlation between GDP and stock market returns on the Malaysian stock market through the retro from 2000-2019. And the research results conducted by (Jareño et al., 2019) also show a same relationship between GDP and stock price ratio in Germany, Italy, Spain, France, UK and US for the period 2000-2014. Another study also talks about the covariate effect of GDP on stock prices in the Baltic countries in the period 2000-2011 (Rudzkis & Valkavičienė, 2014). This is explained by GDP being a strong determinant of changes in financial markets along with the increase of gross domestic product, stock market interest also increases, as people have higher earnings. And the economic and financial outcomes of the issuer have converted better. This information has increased the attractiveness of corporate stocks to domestic and foreign investors, and the potential investment chances also improve. As the demand for stocks increases, people holding stocks are attracted in selling them at higher prices. In the Vietnamese market, GDP growth is a good representative for real economic activities. Just after, through the above studies on the covariate connection between stock prices and GDP. And one of them was studied in the Malaysian market - one of the Southeast Asian countries with a developing economy located next to Vietnam, showing the similarity in the economy between the two countries. From here, we make the following research hypothesis:

H1: ***T****here is a positive impact of GDP on stock market return.*

3.2 FDI Affects Stock Market Return

During the period 1992-2017, companies, which are listed on the Ghana Stock Exchange were affected by the constructive correlation of FDI on stock market returns. Authors (Asravor & Fonu, 2021) have explained based on the development opportunities that FDI inflows bring such as acquiring and transferring technology, improving business management. Moreover, businesses financed by FDI inflows will be able to boost exports and increase trade with many countries around the world. With the study of (Kalam, 2020), the impact of FDI on profitability is not statistically significant on the Malaysian stock market from 2000-2019. The participation of the FDI in industrial sectors and fields is an essential factor in sponsoring Vietnam's economic rearrangement towards modernity, building a vigorous commerce environment and increasing volume to produce merchandise with high gray matter content in the economy. In addition, FDI supports to agricultural reorganization, diversifying products, and enhancing the value of exported agricultural items. Currently, Vietnam is actively acquiring policies to attract FDI such as tax incentives or exemptions, participating in many Free Trade Agreements - FTAs with regional and international countries. From here, we make the following research hypothesis:

H2: *There is a positive impact of FDI on stock market return.*

3.3 Money Supply Affects Stock Market Return

In Vietnam, a study on 144 observed variables of listed companies on the stock market that is influenced by macro factors is authored by (Tuan DAO et al., 2022) implemented in the period 2010-2021. Research has shown that money supply is positively correlated with stock returns. Because this relationship is expressed through monetary policy, with the expansion of monetary policy, more money into circulation, resulting in more funds flowing into the manufacture and use of goods, and increasing the employ of financial assets like stocks.(Bilson et al., 2005; Dong, 2012; Hosseini et al., 2011; Hsing & Hsieh, 2012; Humpe & Macmillan, 2009; Ratanapakorn & Sharma, 2007) based on experience, they have found a close correlation between these two variables. Accordingly, the increase rate of the money supply (M2) impacts the whole economy and hence, stock prices are expected to rise. The growth of M2 money has increased the liquidity of securities, thereby increases the stock price thanks to the devloping request for securities. However, according to the research of (Mukherjee & Naka, 1995), the influence of money source on stock prices is unclear. Increasing the money source causes to inflation, which may increase the discount rate and lower the stock price (Fama, 1981), so it shows a negative correlation. Through the above studies, we can see the similarity of the covariate impact between M2 (money supply) and stock returns in Vietnam and other countries around the world. Therefore, we expect M2 (money supply) to have the same connection with the stock price index in Vietnam. From here, we make the following research hypothesis:

H3: *There is a positive impact of Money supply on stock market returns.*

3.4 Credit Amount Affects Stock Market Return

In the article by (Tuan DAO et al., 2022) talking about the macroeconomics affecting the stock market in Viet Nam from 2010 to 2021, showing a covariate impact between credit and stock market return. This is explained by the fact that the expansion of monetary policy lowers interest rates and increases the source of loanable funds; reduces the capital cost of enterprises, thus increases the expectation as well as the income of investors. This cause encourage cash flow into the stock market, raising the stock price. Interest rate is considered as the opportunity cost of investment. When interest rates fall, corporate investment capital increases, which stimulates companies to invest more and causes stock prices to rise. Through the above studies, we can see the similarity of the positive effect between credit and stock return in Vietnam and other countries around the world. Therefore, we expect credit to have a same connection with the stock price index in Vietnam. From here, we make the following research hypothesis:

H4: *There is a positive impact of Credit amount on stock market return.*

3.5 Deposit Interest Rate Affects Stock Market Return

Authors (Iqmal & Putra, 2020; Tuan DAO et al., 2022) all showed an undesirable effect of the interest rates on the rate of returns in stock markets of developing countries during the year 2000 to now. The reason is explained that as interest rate increases, the amount of available cash of citizens and institutions tends to pour into the financial organization or be participated in government bonds. This happens a decrease in cash flow in the stock market and a drop in the stock market return. In the Vietnamese market, when interest rates are high, people tend to reduce capital spending in the stock market and deposit money in commercial banks to avoid risks and obtain stable interest rates, especially in the current world business situation which is facing many uncertainties. From here, we make the following research hypothesis:

H5: *There is a negative impact of deposit interest rate on stock market return.*

4. Data and Methodology

4.1 Data

The present research investigates the influence of GDP, FDI, Money supply, Credit amount, Deposit interest rate on Stock market return by using the data of Vietnam from 2004–2023. For this purpose, we used Stock market return (SMR) as a dependent variable. On the other hand, we used Foreign Direct Investment Inflows (FDI), Gross Domestic Product (GDP), Monetary Policy of Vietnam State Bank (MP). Further details about the measurement scale and source of data are shown in Table 1.

Table 1. Variables Description.

Variables	Code	Description	Reference
Stock market return	SMR	The yields of the quarterly closing quotations.	(Jareño et al., 2019); (Fasanya & Adekoya, 2022);
Gross Domestic Product growth	GDP	Annual percentage growth rate of GDP at market prices based on constant local currency	(Kalam, 2020); (Jareño et al., 2019)
Foreign Direct Investment Inflows	FDI	The net inflows of Foreign Direct Investment	(Kalam, 2020); (Asravor & Fonu, 2021)
Monetary Policy of Vietnam State Bank	MP1	Money Supply the State Bank injecting to the economy	(Tuan DAO et al., 2022)
	MP3	Deposit Interest rate	(Iqmal & Putra, 2020); (Kalam, 2020); (Fasanya & Adekoya, 2022)

4.2 Model Specification

4.2.1. Quantile Causality

To evidence quantile causality for the collaboration between macroeconomics and stock market returns, based on Jeong, Hardle, and Song (2012), we utilize the causality-in quantile test and launch causality in means, applying the non-parametric Granger-quantile-causality methodology, which is developed by Balcilar, Cerci, and Demirer (2016).

Let $\gamma_{(i,t)}$ be stock market returns and $x_{(i,t)}$ be macroeconomics. In line with Jeong et al. (2012), the experiment assesses the hypothesis that in the incidence of the lag vector $\{y_{t-1}, \dots, y_{t-p}, x_{t-1}, \dots, x_{t-p}\}$ in the θ^{th}quantile, x_t does not happen y_t if

$$Q_\theta(y_{t-1}, \dots, y_{t-p}, x_{t-1}, \dots, x_{t-p}) = Q_\theta(y_{t-1}, \dots, y_{t-p}) \quad (1)$$

However, in the existence of the lag vector

$\{y_{t-1}, \dots, y_{t-p}, x_{t-1}, \dots, x_{t-p}\}$ in the θ^{th}quantile, it is supposed that x_t affects y_t if

$$Q_\theta(y_{t-1}, \dots, y_{t-p}, x_{t-1}, \dots, x_{t-p}) \neq Q_\theta(y_{t-1}, \dots, y_{t-p}) \quad (2)$$

where $Q_\theta(.)$ denotes the θ^{th} quantile of y_t. Note that *t* expects the qualified quantiles, $Q_\theta(.)$, of y_t with a limitation on the quantiles as $0<\theta<1$.

Thereafter, we state $Z_t = X_t, Y_t$, which contains the vectors $y_{t-1} = y_{t-1}, \dots, y_{t-p}$ and $x_{t-1} = x_{t-1}, \dots, x_{t-p}$. We can figure out the restrictive distribution functions $Fy_{t|Z_{t-1}}(y_t|Z_{t-1})$ and $Fy_{t|Y_{t-1}}(y_t|Y_{t-1})$, separately conditioned on the vectors Z_{t-1} and Y_{t-1}. For fundamentally all

Z_{t-1}, we suppose $Fy_{t|Z_{t-1}}(y_t|Z_{t-1})$ to be entirely constant in y_t.

When we define $Q_\theta(Z_{t-1}) \equiv Q_\theta(y_t|Z_{t-1})$ and $Q_\theta(Y_{t-1}) \equiv Q_\theta(y_t|Y_{t-1})$, we can now arrive at $Fy_{t|Z_{t-1}}\{Z_{t-1}\} = \theta$, with probability p = 1.

As a result of Equation (1) and Equation (2), each assumption for causality-in-quantile can be comprehended as

$$H_0: P\{F_{y_t|Z_{t-1}}\{Z_{t-1}\} = \theta\} = 1 \quad (3)$$

$$H_1: P\{F_{y_t|Z_{t-1}}\{Z_{t-1}\} = \theta\} < 1 \quad (4)$$

A fat tail's causality constrasts to the distribution's centre (Jena, Tiwari, Hammoudeh, & Roubaud, 2019; T.-H.; Lee & Yang, 2007). The lag order, p, is determined through the SIC criterion under the VAR that includes stock market returns and macroeconomics.

4.2.2. Quantile-on-Quantile Regression

Made by mixing non-parametric estimations with basic QR, the QQR technique presented by Sim and Zhou (2015) is applied to explore the relation between macroeconomics and stock market returns indices of top-advanced stock market returns regimes, which is a more improved alternate of the basic quantile regression (QR). Based on the conventional quantile regression (Ijasan, Owusu Junior, Tweneboah, Oyedokun, & Adam, 2021; Owusu Junior, Adam, & Tweneboah, 2020; Owusu Junior, Tiwari, Padhan, & Alagidede, 2020; Owusu Junior & Tweneboah, 2020; Tweneboah, Owusu Junior, & Kumah, 2020), the effect of the regressors across multiple quantiles, and the conditional mean of the regressand, are inspected. As a result, the QR approach overtakes the ordinary least squares (OLS) approach. Traditional linear regression advanced by Stone (1977) and Cleveland (1979) estimates the effect of certain quantiles of the independent variable on the conditional average of the dependent variable (Hashmi, Chang, & Rong, 2021). As a consequences, we can consider the stimulus on different quantiles of both the independent and dependent variables by joining classic linear regression with basic quantile regression. This suggests a better consideration of how the independent and dependent variables relate.

Whereas QR can disclose the influence of macroeconomics on the conditional distributions of stock market returns, we cannot remark how the various conditional tails of macroeconomics modify stock market returns. The QQR is essential to assists to complete this by regressing the conditional tails of macroeconomics on the conditional tails of stock market returns because the requirement of macroeconomics can be noticed for diverse state of asset returns and vice versa. Thus, the usage of QQR comparative to QR becomes obligatory in this investigation. Morever, the maintaining modification in asset prices (Gormsen & Koijen, 2020) and household expectations (Hanspal, Weber, & Wohlfart, 2021) indicate that the disease's effect should not be reflected short-lived (Heyden & Heyden, 2021). A long-term impact could most likely display across assets and the real estate industry is not decoupled from this. Thus, in using the QQR, an extensive dataset would be beneficial to a shorter dataset. In spite of the significance of the short-term impact of every market emergency, covering a long period is substantial to expose any conflicting correlation between macroeconomics and stock market returns.

In this investigation, we inspect the effect of varied macroeconomics quantiles on diverse quantiles of the stock market returns of top-advanced stock market returns regimes applying an developed approach termed the QQR method improved by Sim and Zhou (2015). The non-parametric QR model stated in Eq. (5) is spent for this objective.

$$SMR_t = \beta_0(\theta,\tau) + \beta_1(\theta,\tau) \times (Macroeconomics_t) + \varepsilon_t^{\theta} \quad (5)$$

Where SMR_t is Stock Market Return for each industry at time t, $Macroeconomics_t$, is the the independent variables at time t, $\beta_0(\theta,\tau)$ is the intercept of the model; $\beta_1(\theta,\tau)$ is the slope of the relationship between SMR_t and $Macroeconomics_t$, θ represents the θ^{th} quantile distribution of $Macroeconomics_t$, ε_t^{θ} is the quantile error term. Note that while employing the non-parametric method, choosing the suitable bandwidth is crucial. A large bandwidth h matures the estimate's deviation when the variance declines, and vice versa. Following Sim and Zhou (2015), we put a bandwidth value of h = 0.05.

5. Results and Discussion

5.1 Variables Description

Table 2. Descriptive Statistics.

Variable	Obs	Mean	Std. Dev.	Min	Max
SMR	28,740	0.11	0.63	-0.75	9.28
FDI	28,740	3.80	1.20	1.84	6.88
GDP	28,740	0.15	0.12	-0.14	0.61
MP1	28,740	16.66	0.65	15.37	17.57
MP3	28,740	4.09	3.33	0.11	13.41

The consequence of causality-in-quantiles and the quantile regression approaches are deliberated and analysed. The quantile causality outcomes set the speed for us to progress with arguments on the quantile regression and quantile-on-quantile regression methods. We check for the quantile causal relationship between macroeconomics and stock market returns. This is required to prove that certainly there is a causal correlation between dependent variable (SMR) and independent variables (FDI, GDP, MP1, MP3) across conditional distributions. The nonparametric causality-in-quantiles comprises all quantiles in the distribution, as opposite to the basic Granger test that only investigates the median (Jena et al., 2019). Generally, we realize confirmation in provision of the alternate hypothesis that the change in macroeconomics affects the change in stock market returns at lower quantiles, which represent additional insights from the quantile regression approach.

5.2 Quantile Regression Results

Table 3. Quantile Regression results.

SMR(i,t)	R2	_cons	FDI	GDP	MP1	MP3
01	0.28	0.30	-0.04*	0.26***	1.68***	-0.01
02	0.24	0.17	-0.04*	0.34***	1.43***	-0.01
03	0.20	0.77	-0.04***	0.28***	1.08***	-0.03***
04	0.17	1.29*	-0.03**	0.31***	0.92***	-0.03***
05	0.15	1.49***	-0.03**	0.26***	0.50*	-0.04***
06	0.12	1.87***	-0.03**	0.29***	0.36	-0.05***
07	0.10	2.50***	-0.02	0.28***	-0.27	-0.07***
08	0.08	1.98	-0.02	0.20*	-1.42**	-0.11***
09	0.09	1.87	0.01	-0.06	-4.19***	-0.19***
OLS	0.08	0.74	0.01	0.13	-0.41	-0.07***

*** $p \leq 0.001$; ** $0.001 < p \leq 0.05$; * $0.05 < p \leq 0.01$; ns: not Significant.

The SMR(i,t) is positively affected by GDP and MP1. The coefficients are statistically significant in each quantile. Moreover, SMR is negatively influenced by FDI and MP3. Our findings reinforce those from previous investigations that demonstrate the meaningful influence of GDP on SMR, with coefficients being positive in firms with higher returns and

negative in less profitable firms. In section 5.3, we delve into examining the direct impact of each macroeconomic factor on stock market returns.

5.3 Quantile on Quantile Regression Results

This study focuses on the direct relationship between stock market returns and macroeconomics such as GDP, FDI and Monetary Policy (MP1, MP3) on the different stock market circumstances and the nuances of macroeconomic levels. Specifically, we consider that quantiles reflect how bearish, normal or bullish stock market is and whether the macroeconomics index is low, normal or high. To investigate the dynamic dependencies between stock returns and changes in GDP during the bear (bull) states, the linkages between the 10th, 20th, 30th and 40th (60th, 70th, 80th and 90th) return quantiles are considered. The return dependencies during the normal state are determined through the centrally located quantiles (50th return quantile).

Based on the quantile-on-quantile regression approach expressed in Equation (5),

$$SMR_t = \beta_0(\theta,\tau) + \beta_1(\theta,\tau) \times (Macroeconomics_t) + \varepsilon_t^{\theta} \quad (5)$$

the entire dependence between the quantile of gold return (indexed by θ) and the quantile of uncertainty indicators (indexed by τ) can be synthesized by two main parameters: $\beta_0(\theta,\tau)$ and $\beta_1(\theta,\tau)$; which are so-called the intercept term and the slope coefficient, respectively. Being function of θ and τ, both parameters vary depending to the different stock market states and the nuances of macroeconomic impact levels.

Figure 1 to figure 4 show the quantile-on-quantile results between macroeconomics and stock market return. The right side of each figure plots the surface of the intercept term. Unlike the intercept term of the standard quantile regression that are insensitive to uncertain quantiles, the intercept derived from QQR depends to both the quantiles of RMS in the Y-axis and the quantiles of macroeconomics in the X-axis.

The left side of each figure plots the stock return's response to different macroeconomics proxies. Interestingly, as documented by the previous studies on the same issue, we show that the different uncertainty measures display heterogenuous impacts on stock returns (J. Bouoiyour et al, 2019).

5.3.1 Quantile-on-Quantile Estimates between RMS and GDP

Figure 1 illustrates the quantile-on-quantile results between GDP and Stock market return. The right side of Fig. 1 plots the surface of the intercept term while the left side illustrates the surface of the slope term.

We note that the intercept terms are generally positive and greater at the higher quantiles for GDP (i.e., when the local develops its economy) and under various stock market circumstances. For example, the intercept parameter seems positive and strong under bull stock market states (θ¼ 0.8) and when the GDP is hight (τ ¼ 0.4, 0.6, 0.8). It is, however, negative whenever the stock market is bullish or bearish (θ¼ 0.2, 0.4, 0.6, 0.8) and the GDP is low (τ ¼ 0.2, 0.4). In developing economies, as the local economy grows and progresses, the overall GDP tends to increase. This growth leads to a positive relationship between GDP and time, resulting in a positive intercept term. Higher quantiles of GDP indicate stronger economic performance, which can be associated with increased investment, industrialization, and technological advancements, all contributing to economic development.

The slope seems negative and low under bullish market (θ¼ 0.8) and the GDP is too high (τ ¼ 0.8) or too low (τ ¼ 0.2). In the rest of surface, the slope seems positive. In a bullish market, investor sentiment is generally optimistic, and there is a strong demand for stocks, leading to rising stock prices. As the market experiences significant growth and high levels of optimism, investors may become more risk-averse and cautious about potential downside risks. This risk aversion can result in a negative and low slope (θ) as investors may be less willing to take aggressive positions in the market, preferring to secure their gains rather than chasing higher returns. In the rest of the surface where the slope appears positive, it suggests that under moderate GDP levels and in market conditions that are neither excessively bullish nor bearish, investors are more willing to take on risk and invest in the market. In a stable and growing economy with moderate optimism, investors may see opportunities for potential returns and are less concerned about extreme market movements. This is in line with previous research (Jareño et al., 2019; Kalam, 2020; Rudzkis & Valkavičienė, 2014). Given the partially speculative nature of the market, we generally observe a positive relationship between GDP growth and stock market growth in the long run. However, in the short term, GDP may not have an immediate impact on stock prices, leading to an inverse connection in the Vietnamese market.

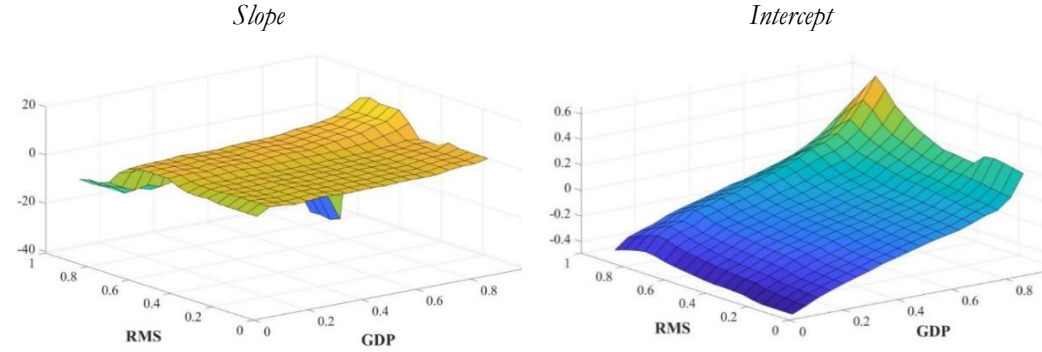

Fig. 1: Quantile-on-Quantile estimates between RMS and GDP.

5.3.2 Quantile-on-Quantile estimates between RMS and FDI

Figure 2 illustrates the quantile-on-quantile results between FDI and Stock market return. The right side of Fig. 2 plots the surface of the intercept term while the left side illustrates the surface of the slope term.

We note that the intercept terms are generally positive and greater at the higher quantiles when the country received more foreign direct investment fundings (τ ¼ 0.8) and under normal stock market circumstances (θ¼ 0.6). The intercept seems negative in all stock market states and when FDI is low (τ ¼ 0.2, 0.4). When the stock market is in a stable and normal state, investor sentiment is relatively neutral. In such circumstances, positive economic indicators, such as increased FDI and steady FDI growth, can contribute to a positive intercept term. Investors may be more confident about the market's potential for returns, leading to a positive relationship between FDI and stock market performance.

The slope seems negative and low under bullish and normal market (θ¼ 0.8, 0.6) and the FDI is too high (τ ¼ 0.8) or too low (τ ¼ 0.2). Then the positive relationship is found in normal stock market state (θ¼ 0.4) and high FDI (τ ¼ 0.8). In the rest of surface, the slope seems no impact. When FDI is high (τ = 0.8), it indicates significant foreign investments in the country's economy. While high FDI can contribute to economic growth, it may also lead to concerns about potential market bubbles or overvaluation of assets. This could cause investors to be

more cautious and result in a negative slope. On the other hand, when FDI is low (τ = 0.2), it suggests a lack of substantial foreign investments in the economy. In such a situation, the market may lack positive catalysts for growth, leading to a negative slope as investors may be more risk-averse. However, in a normal stock market state, where investor sentiment is relatively neutral, the positive economic indicators associated with high FDI can lead investors to see opportunities for potential returns. Currently, the Government of Vietnam is actively formulating policies to attract foreign direct investment, such as providing preferential treatment or tax exemptions. Vietnam is also participating in various free trade agreements to enhance relations with other countries and establish regional and international partnerships and cooperation. The paper by (Asravor & Fonu, 2021) supports the positive impact of foreign direct investment on stock market returns, which differs from the findings of (Kalam, 2020).

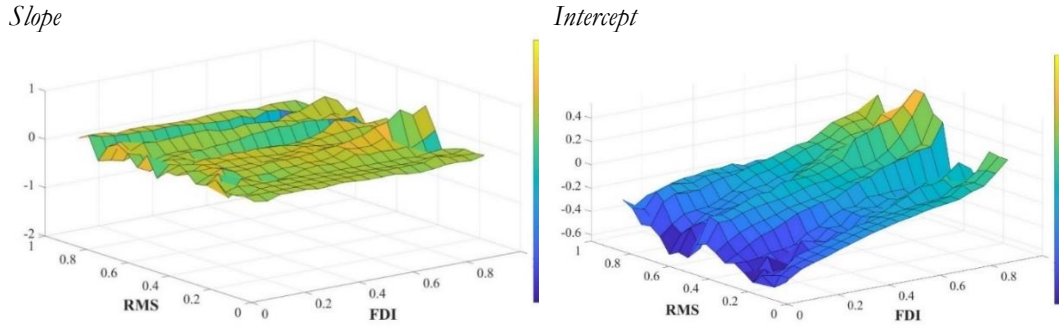

Fig. 2: Quantile-on-Quantile estimates between RMS and FDI.

5.3.3 Quantile-on-Quantile estimates between RMS and MP1

Figure 3 illustrates the quantile-on-quantile results between MP1 and Stock market return. The right side of Fig. 3 plots the surface of the intercept term while the left side illustrates the surface of the slope term.

We note that the intercept terms are generally positive and greater at the higher quantiles for MP1 (money supply of State Bank injecting into the economy) and under various stock market circumstances. For example, the intercept parameter seems positive and strong under bull stock market states (θ¼ 0.8) and when the MP1 is hight (τ ¼ 0.8). It is, however, negative whenever the stock market is bullish, normal or bearish (θ¼ 0.2, 0.4, 0.6, 0.8) and the MP1 is low (τ ¼ 0.2, 0.4, 0.6). MP1 represents the quantity of money injected into the economy by the central bank through various monetary policy measures such as open market operations or changes in reserve requirements. When the central bank increases the money supply (MP1) through expansionary monetary policy, it can lead to lower interest rates, increased liquidity, and more funds available for borrowing and investment. The combination of bullish market conditions and high MP1 enhances the positive impact on the economy and stock market, resulting in a strong intercept. However, even if the central bank implements expansionary monetary policy, investors may still remain skeptical about the market's sustainability or may be concerned about potential economic challenges. This cautious behavior can result in a negative intercept, as investors may hold back from making aggressive investments in the stock market, leading to subdued performance.

The slope seems negative and lowest under bearish market (θ¼ 0.2, 0.4) and under various MP1 circumstances (τ ¼ 0.2, 0.4, 0.6, 0.8). The slope seems improve and turns positive when the stock market change from bearish state to normal and bullish. The slope gets highest

positive impact under bullish market (θ¼ 0.8) and under high MP1 (τ ¼ 0.8). In a bearish market, investor sentiment is pessimistic, and there is a strong demand for safe-haven assets, leading to declining stock prices. Therefore, under various MP1 circumstances (low, moderate, and high), investors may remain cautious and may not be confident in the sustainability of any market recovery, resulting in a subdued impact on the stock market. As the stock market transitions from bearish to normal and bullish states, investor sentiment becomes more optimistic. The change in investor behavior from risk-averse to more risk-tolerant under normal and bullish market states can lead to a more pronounced impact of MP1 on the stock market performance. That is also mentioned in the research paper (Tuan DAO et al., 2022)_ in the Vietnam market. This finding differs from the previous study by Fama (1981), which discussed how increasing money supply leads to inflation, causing liquidity to decrease and resulting in a decline in stock prices.

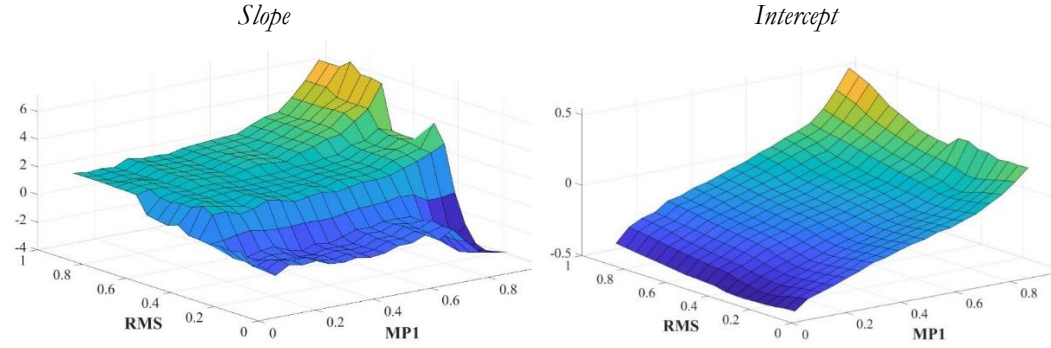

Fig. 3: Quantile-on-Quantile estimates between RMS and MP1.

5.3.4 Quantile-on-Quantile estimates between RMS and MP3

Figure 4 illustrates the quantile-on-quantile results between MP3 and Stock market return. The right side of Fig. 4 plots the surface of the intercept term while the left side illustrates the surface of the slope term. MP3 is the maximum savings deposit interest rate at commercial banks as regulated by the central bank at specific periods.

We note that the intercept terms are generally positive and greater at the higher quantiles for MP3 (τ ¼ 0.8) and under bearish stock market states (θ¼ 0.2). In the rest of surface, the intercept seems negative. When the maximum savings deposit interest rate (MP3) is set at a high level (τ = 0.8) by the central bank, it can attract more funds into savings accounts at commercial banks. During bearish market conditions, investors may seek to reduce their exposure to risky assets like stocks and look for safer alternatives. As a result, they might choose to move their funds into savings accounts at commercial banks due to the perceived stability and security of these accounts. This shift in investor behavior can lead to increased deposits in banks and a positive intercept, even under bearish market conditions.

The slope seems negative and low under bearish market (θ¼ 0.2) and under various MP3 circumstances (τ ¼ 0.2, 0.4, 0.6, 0.8). The slope seems lowest when MP3 is highest (τ ¼ 0.8). Under normal and bullish market (θ¼ 0.4, 0.6, 0.8) and under different MP3 circumstances, the slope turns zero. In a bearish market, even if the MP3 is set at a higher level (τ = 0.8), investors may prioritize capital preservation and may not be inclined to invest aggressively in the stock market. This cautious behavior can result in a negative and low slope as investors remain risk-averse. The lowest slope observed when MP3 is set at its highest level can be

explained by the dominance of conservative investment behavior among investors. The zero-slope observed under normal and bullish market states, indicating that changes in MP3 have no significant impact on stock market performance under normal and bullish market conditions. The authors' previous studies (Iqmal & Putra, 2020; Kalam, 2020; Tuan DAO et al., 2022) also support the findings regarding the negative impact of interest rates on stock returns.

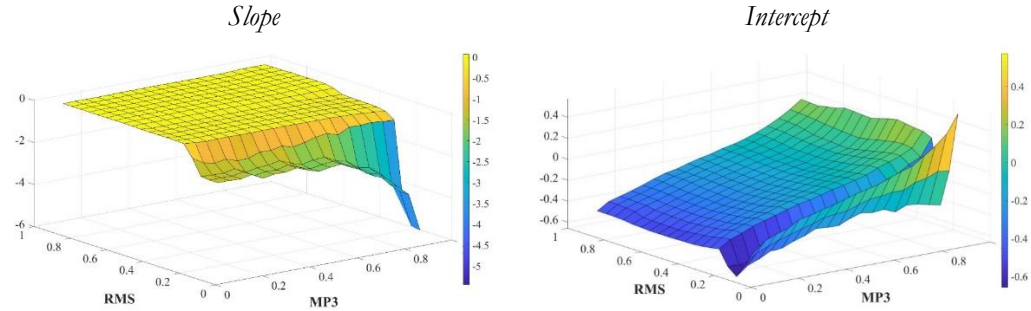

Fig. 4: Quantile-on-Quantile estimates between RMS and MP3.

Note: Above figure shows the slope coefficients and the below-sides show the intercept. The colours in the colour bar reflect the strength of correlation between the independent and dependent variables. The red colour shows a strong positive correlation, the dark blue colour shows a strong negative correlation, while the light green and light blue colours show a weekly or insignificant correlation.

Overall, our results indicate that stock market serves as a safe haven against all the types of macroeconomics, but as a hedge solely against the macroeconomics impact. These properties depend also to the stock market conditions (bullish, normal or bearish state). The above mixed findings which can be traced back to the various definitions and determinants of these uncertainty indicators.

6. Conclusion

The paper examines the level of impact of macroeconomics on stock market return by applying quantile-on-quantile regression model. This article expands on the general focus on the correlation between stock returns and analyzes the response of stock returns to changes in GDP, FDI, and monetary policies of the central bank. While some recent studies have attempted to explore the relationship between stock price dynamics and the uncertainty in macroeconomic factors, there has been no research so far that examines the core impacts of uncertainty on the trajectory of stock prices while specifically paying attention to tail dependencies. That's why we employ quantile on quantile regression to investigate the response of stock market returns to various macroeconomic indicators under different stock market conditions and different stages of the macroeconomy.

With 28,740 quarterly observations from the 1st quarter of 2004 to the 1st quarter of 2023, our findings indicate a strong and significant dependence between stock returns and macroeconomic indicators during periods of high macroeconomic volatility. It is not surprising that stocks provide excellent protection against increasing macroeconomic volatility. These equities have long been considered a hedge and an effective safe haven for storing value. However, the novelty of this study relies on the inference that (i) the role of stocks as a hedge

or safe haven during macroeconomic uncertain periods depends on different market circumstances, the nature of macroeconomic volatility, and the measures used to gauge it, and (ii) the relationship between stocks and macroeconomic volatility is nonlinear, possibly influenced by traders' sentiments, supply and demand dynamics in the stock market, price fluctuations of other assets, and regular and unconventional monetary policies.

The timely and useful detection of direct relationships between macroeconomic indicators (GDP, FDI, MP1, MP3) and stock market returns (SMR) is beneficial for both individual and institutional investors. When investors are aware of how changes in macroeconomic indicators impact stock market performance, they can adjust their investment strategies accordingly. For example, if a positive relationship between GDP growth and stock market returns is detected, investors may choose to increase their exposure to stocks during periods of economic expansion. Knowledge of the direct relationships between macroeconomic indicators and stock market returns can help investors in managing their portfolio risks. During periods of high macroeconomic uncertainty or volatility, investors may seek to diversify their portfolio to mitigate risks. For instance, if an increase in FDI is found to positively impact stock market returns, investors may consider sectors or companies that are likely to benefit from higher foreign investments. Recognizing the impact of monetary policies (MP1 and MP3) on stock market returns can help investors anticipate potential shifts in the market. Central banks often use monetary policy tools to influence economic growth and financial markets. Being aware of the link between these policies and stock market performance can assist investors in understanding potential market trends. For institutional investors, such as pension funds or endowments, understanding the direct relationships between macroeconomic factors and stock market returns is crucial for long-term planning and asset allocation strategies. They need to consider how macroeconomic trends might influence their portfolio returns over extended periods.

For future research, it would be interesting to extend this analysis to other types of assets such as bonds, commodities, or real estate. Investigating how different asset classes respond to macroeconomic volatility could provide further insights into their diversification benefits and potential risk-reduction characteristics. Additionally, exploring how various macroeconomic indicators interact with each other and affect different asset classes could offer valuable information for investors seeking to build well-diversified and resilient portfolios. Understanding the dynamics between macroeconomic conditions and various asset classes can help investors make more informed decisions and navigate the complexities of financial markets more effectively.

7. Theoretical Contribution and Managerial Implication

On the one hand, the paper supports classical theories of interest rates in the Vietnamese market. When interest rates increase, individuals and organizations tend to decrease their investment in the stock market and deposit savings in commercial banks or invest in government bonds to avoid risks and obtain a stable interest rate. High interest rates also reduce the demand for investment capital due to the increase in interest payments and input costs. The study also supports the Fisher effect theory, which suggests raising interest rates as a solution to control inflation. Increased interest rates attract deposits to the bank and help secure capital to support the economic recovery process. Furthermore, when Vietnam's economy is affected by inflation within a moderate and controllable level, the government applies a policy of pump priming, stimulating consumption and borrowing demand from individuals and businesses to promote development opportunities, improve production, and

expand business operations. This supports Keynes' economic theory about the government using its budgetary power to control the spending of individuals and businesses.

On the other hand, in practical terms, the study has shown the multidimensional impact of macroeconomics on financial market returns, aiding macro-policy making to regulate State policy tools in the relationship of interconnected macro factors and avoid negative market effects. Monetary policy plays a critical role in achieving economic goals such as controlling inflation and fostering higher economic growth. The research results also support domestic and foreign enterprises to objectively assess the impacts of macroeconomics on securities investment efficiency and capital raising, helping them overcome challenges and seek cooperation opportunities. Investors gain an overview of macroeconomics' impact on the stock market, enabling them to predict how economic variables in Vietnam affect their assets when trading. This reduces worry and panic over economic fluctuations, limiting herd mentality. Additionally, countries with similar economic characteristics to Vietnam can use these findings as a basis for objectively assessing their financial situation and adjusting their political policies based on the impact of macroeconomics on stock market returns.

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Author Contributions

Conceptualization, Nguyen-Quynh-Nhu Ngo; Methodology, Mabruk Billah; Software, Mabruk Billah; Validation, Mohammad Talha; Formal analysis, Nguyen-Quynh-Nhu Ngo; Investigation, Mohammad Talha; Resources, Nguyen-Quynh-Nhu Ngo; Data curation, Mabruk Billah; Writing - original draft, Mohammad Talha and Nguyen-Nhu-Ngoc Ngo; Writing - review & editing, Nguyen-Quynh-Nhu Ngo and Mohammad Talha. All authors have read and agreed to the published version of the manuscript**.**

Declaration of Competing Interest

None to declare.

Reference

Academy, T., Science, P., Academy, T., Science, P., & Quarterly, P. S. (2014). *Recent Literature on Interest : A Supplement to Capital and Interest . by Eugene V . Bohm- Bawerk ; William A . Scott ; Siegmund Feilbogen ; The Nature and Necessity of Interest . by G . Cassel Review by : Frank A . Fetter*. *20*(1), 149–151.

Akerlof, G. A. (1970). The market for lemons: quality uncertainty and the market mechanism. *Quarterly Journal of Economics*, *84*(3), Q. J. Econ.

Ascari, G., Fasani, S., Grazzini, J., & Rossi, L. (2023). Endogenous uncertainty and the macroeconomic impact of shocks to inflation expectations. *Journal of Monetary Economics*, *xxxx*. https://doi.org/10.1016/j.jmoneco.2023.04.002

Asravor, R. K., & Fonu, P. D. D. (2021). Dynamic relation between macroeconomic variable, stock market returns and stock market development in Ghana. *International Journal of Finance and Economics*, *26*(2), 2637–2646. https://doi.org/10.1002/ijfe.1925

Berthold, B. (2023). The Macroeconomic Effects of Uncertainty and Risk Aversion Shocks. *SSRN Electronic Journal*, *154*, 104442. https://doi.org/10.2139/ssrn.4328418

Bilson, C., Brailsford, T. J., & Hooper, V. J. (2005). Selecting Macroeconomic Variables as

Explanatory Factors of Emerging Stock Market Returns. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.201908

Cleary, S. (1999). The relationship between firm investment and financial status. *Journal of Finance*, *54*(2), 673–692. https://doi.org/10.1111/0022-1082.00121

Dong, Z. (2012). No TitleФормирование парадигмальной теории региональной экономики. *Экономика Региона*, *Kolisch 1996*, 49–56.

Fama, E. F. (1981). Stock Returns, Real Activity, Inflation, and Money. *American Economic Association Stock Returns The American Economic Review*, *71*(4), 545–565. http://www.jstor.org/stable/1806180%5Cnhttp://www.jstor.org/stable/1806180

Fasanya, I. O., & Adekoya, O. B. (2022). Macroeconomic risk factors and REITs returns predictability in African markets: Evidence from a new approach. *Scientific African*, *17*, e01292. https://doi.org/10.1016/j.sciaf.2022.e01292

Gala, V. D., Pagliardi, G., & Zenios, S. A. (2023). Global political risk and international stock returns. *Journal of Empirical Finance*, *72*(March), 78–102. https://doi.org/10.1016/j.jempfin.2023.03.004

García-García, P., Carpintero, Ó., & Buendía, L. (2020). Just energy transitions to low carbon economies: A review of the concept and its effects on labour and income. *Energy Research and Social Science*, *70*(June), 101664. https://doi.org/10.1016/j.erss.2020.101664

Gjerde, Ø., & Sættem, F. (1999). Causal relations among stock returns and macroeconomic variables in a small, open economy. *Journal of International Financial Markets, Institutions and Money*, *9*(1), 61–74. https://doi.org/10.1016/S1042-4431(98)00036-5

Gupta, P., He, D., Ma, Y., & Yur-Austin, J. (2022). Do investors listen? Exploring the effect of investor relationship management on firm-specific stock return variation. *Research in International Business and Finance*, *60*(October 2020), 101598. https://doi.org/10.1016/j.ribaf.2021.101598

Guven, M., Cetinguc, B., Guloglu, B., & Calisir, F. (2022). The effects of daily growth in COVID-19 deaths, cases, and governments' response policies on stock markets of emerging economies. *Research in International Business and Finance*, *61*(February), 101659. https://doi.org/10.1016/j.ribaf.2022.101659

Harrod, R. F. (1939). An Essay in Dynamic Theory. *Economic Journal*, The economic journal. https://www.jstor.org/page-scan-delivery/get-page-scan/2224803/0

Hick, J. R. (1937). Mr. Keynes and the "Classics" a suggested interpretation. *Econometrica*, *5*(2), Econometrica.

Hosseini, S. M., Ahmad, Z., & Lai, Y. W. (2011). The Role of Macroeconomic Variables on Stock Market Index in China and India. *International Journal of Economics and Finance*, *3*(6), 233–243. https://doi.org/10.5539/ijef.v3n6p233

Hsing, Y., & Hsieh, W. jen. (2012). Impacts of macroeconomic variables on the stock market index in Poland: New evidence. *Journal of Business Economics and Management*, *13*(2), 334–343. https://doi.org/10.3846/16111699.2011.620133

Humpe, A., & Macmillan, P. (2009). Can macroeconomic variables explain long-term stock market movements? A comparison of the US and Japan. *Applied Financial Economics*, *19*(2), 111–119. https://doi.org/10.1080/09603100701748956

Iqmal, F. M., & Putra, I. G. S. (2020). Macroeconomic Factors and Influence on Stock Return That Impact the Corporate Values. *International Journal of Finance & Banking Studies (2147-4486)*, *9*(1), 68–75. https://doi.org/10.20525/ijfbs.v9i1.667

Jareño, F., Escribano, A., & Cuenca, A. (2019). Macroeconomic variables and stock markets: An international study. *Applied Econometrics and International Development*, *19*(1), 43–57.

Kalam, K. (2020). The Effects of Macroeconomic Variables on Stock Market Returns:

Evidence from Malaysia's Stock Market Return Performance. *Journal of World Business*, *55*(August), 1–13. https://www.researchgate.net/publication/344158504

Kamal, M. R., Ahmed, S., & Hasan, M. M. (2023). The impact of the Russia-Ukraine crisis on the stock market: Evidence from Australia. *Pacific Basin Finance Journal*, *79*(February), 102036. https://doi.org/10.1016/j.pacfin.2023.102036

Keynes, J. M., Rostow, E. V., & Meade, J. E. (1936). The General Theory of Employment, Interest and Money. *The Yale Law Journal*, *47*(3), 498. https://doi.org/10.2307/791960

Kilic, Y., Destek, M. A., Cevik, E. I., Bugan, M. F., Korkmaz, O., & Dibooglu, S. (2022). Return and risk spillovers between the ESG global index and stock markets: Evidence from time and frequency analysis. *Borsa Istanbul Review*, *22*, S141–S156. https://doi.org/10.1016/j.bir.2022.11.015

MILTON FRIEDMAN. (1968). THE ROLE OF MONETARY POLICY. *The American Economic Review*, *34*(2), 78–86.

Moradi, M., Appolloni, A., Zimon, G., Tarighi, H., & Kamali, M. (2021). Macroeconomic factors and stock price crash risk: Do managers withhold bad news in the crisis-ridden Iran market? *Sustainability (Switzerland)*, *13*(7), 1–16. https://doi.org/10.3390/su13073688

Mukherjee, T. K., & Naka, A. (1995). Dynamic Relations Between Macroeconomic Variables and the Japanese Stock Market: an Application of a Vector Error Correction Model. *Journal of Financial Research*, *18*(2), 223–237. https://doi.org/10.1111/j.1475-6803.1995.tb00563.x

Munir, K., & Riaz, N. (2019). Fiscal policy and macroecomonic stability in South Asian Countries. *Hacienda Publica Espanola*, *228*(1), 13–33. https://doi.org/10.7866/HPE-RPE.19.1.1

Munir, K., & Riaz, N. (2020). Macroeconomic effects of exogenous fiscal policy shocks in Pakistan: A disaggregated SVAR analysis. *Hacienda Publica Espanola*, *233*(2), 141–165. https://doi.org/10.7866/HPE-RPE.20.2.6

MYERS, S. C. (1984). The Capital Structure Puzzle. *The Journal of Finance*, *39*(3), 574–592. https://doi.org/10.1111/j.1540-6261.1984.tb03646.x

Myers, S. C., & Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics*, *13*(2), 187–221. https://doi.org/10.1016/0304-405X(84)90023-0

Neaime, S., & Gaysset, I. (2022). Macroeconomic and monetary policy responses in selected highly indebted MENA countries post Covid 19: A structural VAR approach. *Research in International Business and Finance*, *61*(May), 101674. https://doi.org/10.1016/j.ribaf.2022.101674

Oanh, T. T. K. (2022). The impact of COVID-19 vaccination on stock market: is there any difference between developed and developing countries? *Heliyon*, *8*(9), e10718. https://doi.org/10.1016/j.heliyon.2022.e10718

Ochenge, R., Muriu, P., & Ngugi, R. (2020). Macroeconomic Conditions and Stock Market Liquidity in Kenya. *International Journal of Economics and Finance*, *12*(12), 47. https://doi.org/10.5539/ijef.v12n12p47

Phelan, J. (2012). Milton Friedman and the rise and fall of the Phillips Curve. In *The Commentator* (pp. 1–7). http://www.thecommentator.com/article/1895/milton_friedman_and_the_rise_and_fall_of_the_phillips_curve

Phelps, E. S. (1967). Phillips Curves, Expectations of Inflation and Optimal Unemployment over Time. *Economica*, *34*(135), 254. https://doi.org/10.2307/2552025

Phillips, A. W. (1958). The Relation Between Unemployment and the Rate of Change of Money Wage Rates in the United Kingdom, 1861–19571. *Economica*, *25*(100), 283–299. https://doi.org/10.1111/j.1468-0335.1958.tb00003.x

Pradhan, A. K., Mishra, B. R., Tiwari, A. K., & Hammoudeh, S. (2020). Macroeconomic factors and frequency domain causality between Gold and Silver returns in India. *Resources Policy*, *68*(May), 101744. https://doi.org/10.1016/j.resourpol.2020.101744

Quarterly, T., & May, N. (2014). *Irving Fisher ' s " Theory of Interest " by Irving Fisher*. *45*(3), 499–516.

Ratanapakorn, O., & Sharma, S. C. (2007). Dynamic analysis between the US stock returns and the macroeconomic variables. *Applied Financial Economics*, *17*(5), 369–377. https://doi.org/10.1080/09603100600638944

Ross, S. A. (1977). The determination of financial structure: the incentive signalling approach. *The Bell Journal of Economics*, *8*(1), 23–40. https://doi.org/10.2469/dig.v27.n1.2

Rudzkis, R., & Valkavičienė, R. (2014). Econometric models of the impact of macroeconomic processes on the stock market in the Baltic countries. *Technological and Economic Development of Economy*, *20*(4), 783–800. https://doi.org/10.3846/20294913.2014.949901

Salisu, A. A., Sikiru, A. A., & Vo, X. V. (2020). Pandemics and the emerging stock markets. *Borsa Istanbul Review*, *20*, S40–S48. https://doi.org/10.1016/j.bir.2020.11.004

Samuelson, P. A., & Solow, R. M. (1960). American Economic Association Analytical Aspects of Anti-Inflation Policy. *Source: The American Economic Review*, *50*(2), 177–194.

Tseng, K. (2022). Learning from the Joneses: Technology spillover, innovation externality, and stock returns. *Journal of Accounting and Economics*, *73*(2–3), 101478. https://doi.org/10.1016/j.jacceco.2022.101478

Tuan DAO, H., Hang, L. V., Lam PHAM, T., & Trang NGUYEN, K. (2022). Macro-Economic Factors Affecting the Vietnam Stock Price Index: An Application of the ARDL Model. *Journal of Asian Finance*, *9*(5), 285–0294. https://doi.org/10.13106/jafeb.2022.vol9.no5.0285

Xiang, E., Gasbarro, D., Cullen, G., & Ruan, W. (2020). Does R&D expenditure volatility affect stock return? *Journal of Contemporary Accounting and Economics*, *16*(3), 100211. https://doi.org/10.1016/j.jcae.2020.100211

Xu, L. (2021). Stock Return and the COVID-19 pandemic: Evidence from Canada and the US. *Finance Research Letters*, *38*(July 2020), 101872. https://doi.org/10.1016/j.frl.2020.101872

Zulfigarov, F., & Neuenkirch, M. (2020). The impact of oil price changes on selected macroeconomic indicators in Azerbaijan. *Economic Systems*, *44*(4), 100814. https://doi.org/10.1016/j.ecosys.2020.100814