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Dynamics Between Foreign Portfolio Investment, Stock Price and Financial Development in South Africa: A SVAR Approach

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Abstract: The goal of this study is to look into the dynamic relationship between stock prices, foreign portfolio investment, and financial development in the South African economy. Federal Reserve Economic Data (FRED) provided quarterly time series data from 1960 (Q1) to 2024 (Q2). This study uses a structural VAR estimation approach and dynamic conditional correlation (DCC GARCH model). The DCC GARCH approach displays time-varying correlations between stock prices, credit given to the private sector as a measure of financial growth, and foreign portfolio investments. The dynamic links between stock prices, financial development, and foreign private investment (FPI) are examined using the SVAR technique. Our findings show that a financial development shock encourages and provokes a substantial influx of foreign portfolio investment into the South African economy. This suggests that overseas portfolio investments react favorably and notably well to favorable shocks in the financial development process. We suggest that a stable financial system framework and lower credit costs would strengthen the impact of higher stock prices on private sector credit and guarantee that higher stock prices have a beneficial impact on other financial development metrics. Better financial development metrics, such as credit to the private sector, will therefore increase foreign portfolio investment.

Keywords: FPI; stock price; financial development; SVAR

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1. Introduction

The South African economy like any other economy can be greatly affected by the intricate relationship that exists between foreign portfolio investment (FPI), stock prices, and financial development. FPI refers to investments made by foreign investors in a country's stock markets, bonds, or other financial assets without seeking control over the companies. Financial resources are most commonly transferred through foreign direct investment (FDI) and foreign portfolio investment (FPI). Due of the lengthy and onerous requirements associated with FDI, which is a long-term investment, investors always prefer FPI over FDI Shah (2023).

FPI provides an influx of capital into the host country, which can help finance development projects, stabilize the currency, and deepen the financial markets. The inflow of FPI tends to increase demand for equities, leading to higher stock prices. Conversely, an outflow of FPI can depress stock prices. Stock prices are often seen as a barometer of a country's economic health. Rising stock prices typically indicate investor confidence, while falling prices suggest the opposite (Rajan & Zingales, 1998, 2003; Herwartz & Walle, 2014).

Foreign portfolio investment (FPI) plays a critical role in the global financial ecosystem, offering both opportunities and challenges for emerging and developed markets alike. As

a form of international capital flow, FPI involves foreign investors purchasing domestic securities, such as stocks and bonds, without taking direct control over the companies. This inflow of capital can significantly influence domestic financial markets, particularly stock prices, and contribute to the broader process of financial development.

Over the past few decades, the globalization of financial markets has facilitated the increased mobility of capital across borders. This surge in FPI has been driven by several factors, including the liberalization of financial markets, technological advancements, and the quest for higher returns in emerging economies. However, the implications of these investments are complex and multifaceted, as they can lead to both positive and negative outcomes for the host economies (Sanusi & Kapingura, 2022).

The relationship between FPI and stock prices is one of the most extensively studied areas within the field of international finance. It has been argued that the stock market is crucial in drawing in foreign investors. Foreign investors' confidence is bolstered by rising stock market returns, which in turn motivates them to make additional stock market investments.

Stock prices, as a barometer of economic health and investor sentiment, are highly sensitive to the inflows and outflows of foreign capital. An increase in FPI often leads to a rise in stock prices due to a heightened demand for domestic securities. Conversely, sudden withdrawals of FPI can trigger sharp declines in stock prices, exacerbating market volatility. This dynamic interaction between FPI and stock prices highlights the significance of foreign capital in shaping domestic financial markets. Nevertheless, the majority of empirical research that has been undertaken so far has focused on how FDI affects stock prices, paying very little attention to how stock prices affect FPI. Available studies include among others Aqeel et al. (2004), Love and Lage-Hidalgo (2000) and Froot and Stein (1991). On the other hand, FPI is theoretically more likely than FDI to have a direct and noticeable impact on stock prices (Shabbir & Muhammad, 2019). Among the few known studies on the nexus between FPI and stock prices is Shabbir and Muhammad (2019). Shabbir and Muhammad (2019) examined by means of autoregressive distributed lag (ARDL) the long run relationships between stock prices and FPI. Their findings established significant relationships between FPI and stock prices in Pakistan.

Furthermore, it is impossible to ignore how FPI affects financial development. The term "financial development" describes the advancement of a nation's banking, stock market, and regulatory framework systems, as well as their depth, accessibility, and efficiency. By increasing liquidity, boosting market efficiency, and encouraging the transfer of financial innovations and practices, FPI can support financial development. However, these advantages are dependent on the host nation's capacity to control and successfully manage international capital flows in order to reduce dangers like asset bubbles and financial instability. As noted earlier under the relationship between FPI and stock prices argument, much empirical research to date has also concentrated on the relationship between FDI and financial growth, with relatively less emphasis paid to the relationship between FPI and financial development (Sethi et al., 2022; Pham et al., 2022; Jena & Sethi, 2021; Tongurai & Vithessonthi, 2020).

The interplay between FPI, stock prices, and financial development is particularly pronounced in emerging markets, where financial systems are often less mature and more susceptible to external shocks. In these economies, the influx of foreign capital can stimulate financial development by providing much-needed funds for investment and innovation. However, the volatility associated with FPI can also pose significant risks, leading to boom-and-bust cycles that can undermine economic stability and hinder long-term growth (Rashid & Husain, 2011; Rashid, 2010; Otker-Robe et al., 2007; Stevens, 2006).

They contended that the host nation faces challenges as a result of capital inflows, such as the real appreciation of their national currencies.

In developed markets, while the financial systems are typically more robust, the influence of FPI remains significant. Foreign investments can drive market trends, influence monetary policy, and even affect exchange rates. The interconnectedness of global financial markets means that developments in one region can have far-reaching implications for others, underscoring the importance of understanding the dynamics of FPI in the context of financial development (Anetor, 2020; Adams et al., 2014).

This research attempted to explore the intricate relationship between foreign portfolio investment, stock prices, and financial development in the South African economy. Consequently, this study provides insights into how FPI influences stock market behavior and contributes to the financial development of host economies. Additionally, the study provides policy recommendations to ensure that the benefits of foreign portfolio inflows are maximized while minimizing the risks of financial instability. Though the research seeks to contribute to the broader discourse on the role of international capital flows in shaping the global financial landscape, this study specifically contributes to the empirical evidence in the South African economy. Our discussion is outlined as follows: Section 2 of the discussion continues with an overview of the empirical literature, Section 3 delves into the empirical strategy, the empirical results are in Section 4, and Section 5 includes a final comment.

2. Literature Review: Theoretical Perspectives and Empirical Evidence

2.1. Theoretical Perspectives

The conventional capital asset pricing model (CAPM) states that changes in the demand for particular financial assets can have an impact on stock prices through foreign investment flows. Assuming that the supply of stocks is comparatively inelastic in the near run, the demand for local equities increases as foreign investors increase their holdings of these stocks.

According to the "market efficiency" theory, stock prices are updated to reflect all available information. Foreign investors may introduce stronger corporate governance norms, risk diversification techniques, and more information when they join a market. The additional scrutiny may result in more effective stock pricing. Furthermore, as foreign investors frequently insist on transparency and compliance with international accounting and regulatory standards, there may be less information asymmetry as a result of foreign investment.

The "push and pull" paradigm is an alternative viewpoint that posits external (e.g., global liquidity circumstances) and internal (e.g., domestic market potential) variables as the driving forces behind stock price changes in emerging markets. These variables influence FPI, which can affect stock prices in both stabilizing and destabilizing ways. While abrupt withdrawals, or "capital flight," can result in steep corrections and increased market volatility, a significant inflow of foreign capital has the potential to push stock prices above their fundamentals and create bubbles.

Empirical Evidence

One of the most hotly contested topics in the finance literature is how stock prices and financial development are affected by FPI. FPI can add volatility even as it increases market depth and liquidity, especially in countries with less established financial systems. The heightened sensitivity of foreign investors to external shocks, such as shifts in global interest rates or risk sentiment, might result in massive capital flight during uncertain times. According to Claessens and Forbes' (2013), while foreign investors frequently use

long-term investments to stabilize markets, they can also increase volatility during times of crisis.

In developing and emerging markets, FPI has often been linked with higher stock price volatility due to the speculative nature of some foreign investments. For instance, studies by Bekaert and Harvey (1995) highlight that while foreign investment contributes to market development, it also increases vulnerability to global shocks. This volatility arises due to sudden changes in global interest rates or geopolitical conditions, leading to sharp inflows or outflows of capital.

According to Levine and Zervos (1998), FPI has a favorable impact on the growth of stock markets and has a major impact on emerging market capitalization, turnover ratios, and stock market liquidity. Studies by Errunza (2001) and Edison and Warnock (2003), among others, have shown that stock market integration via FPI lowers a company's cost of capital and promotes more effective resource allocation within an economy.

A bidirectional association between FPI and financial development has been proven by numerous studies. While international investors favor nations with competent financial institutions and well-functioning capital markets, financial development may, on the one hand, draw in more foreign portfolio investment. Conversely, FPI can advance financial development through strengthening financial markets, increasing market liquidity, and encouraging rivalry between local financial institutions. As they offer an environment that is favorable to investors, Otchere et al. (2016) noted that nations with highly developed financial systems typically draw more foreign direct investment (FPI). This is consistent with other studies such as Hajilee and Al Nasser (2015) and Agbloyor et al. (2013). Hajilee and Al Nasser (2015) have demonstrated that there is a mutually reinforcing relationship in Latin American nations between developed financial systems and total foreign direct investment (FDI). They argued that financial changes aimed at bolstering financial markets are sparked by inward foreign direct investment. By lowering the cost of capital and improving accessibility to financial services, these reforms encourage more FDI inflows. They conclude that enhancing the development of financial markets can help nations attract more foreign investment, which will feed back into the growth of the financial sector and enhance investment overall.

On the other hand, Irandoust (2021) finds evidence of unidirectional causality from financial development to capital inflow as foreign capital inflow is found not to have an impact on financial development. They demonstrated how financial development offered finance and financial services at a lower cost for investment expansion to overseas businesses and their local connections. Host nations may become more appealing to foreign direct investment (FDI) if they have a solid financial system, robust investor protection, and improved governance laws. Potential imbalances may result from emerging markets' financial development frequently lagging behind the inflow of foreign capital. Hermes and Lensink (2003) discovered, for instance, that the advantages of FPI are greatest in nations with sophisticated financial markets capable of receiving and distributing the inflows effectively. Large FPI inflows, on the other hand, might cause financial instability in less developed financial systems since the local market cannot handle the abrupt surge in liquidity. Similarly, using the system GMM estimator, Pham et al. (2022) examined the relationships between financial development and foreign direct investment (FDI) and demonstrated that higher levels of financial development attracted more inbound FDI to host nations.

Conversely, Gebrehiwot (2016) did not establish a significant connection between foreign direct investment (FDI) and financial development in eight countries in Sub-Saharan Africa (SSA) between 1991 and 2013. They concluded that there is insufficient evidence to support the claim that foreign capital inflow and financial development are related using

both the Granger causality test and the two-stage least squares (2SLS). This is consistent with findings of Sahin and Ege (2015) as they also found inconclusive evidence between foreign capital inflow and a developed financial system.

3. Data Sources and Method

3.1. Data Description and Summary

Federal Reserve Economic Data (FRED) served as the source of the quarterly time series data spanning from 1960 (Q1) to 2024 (Q2). More precisely, data on foreign portfolio inflow (FPI) and credit allocated to the private sector (CA) as a proxy for financial development were sourced from FRED. Data on stock prices were indexed by share price and the data were obtained from the Organization for Economic Co-operation and Development (OECD). The graphical representation of the variables is presented in Figure 1. The variables have been generally noted to observe an upward trend, with the exception of foreign portfolio investment where sharp decline can be observed around the year 2020. The sharp decline around this period could be attributed to the world-wide economic closure associated with COVID-19. In addition, our variables could also be observed to be non-stationary. Hence, we investigated the stationary property of the series and we found that the all the variables are stationary in their first differenced level. The graphical representation of the variables in their differenced form is contained in Figure 2.

The pairwise correlation coefficients, or static correlation coefficients, are shown in Figure 3. As anticipated, there is little correlation between the variables under investigation. However, because they do not reflect the correlation changes that take place over time, these correlation coefficients are static. Only the contemporaneous or instantaneous relationship throughout time is shown. The current study examines the time-varying correlation between the variables using dynamic conditional correlation (DCC GARCH). The DCC GARCH approach reveals time-varying correlation between foreign portfolio investment, stock prices, and credit allocated to private sector as a measure of financial development. While SVAR approach enables us to obtain the contemporaneous shocks between foreign private investment (FPI), stock prices, and financial development.

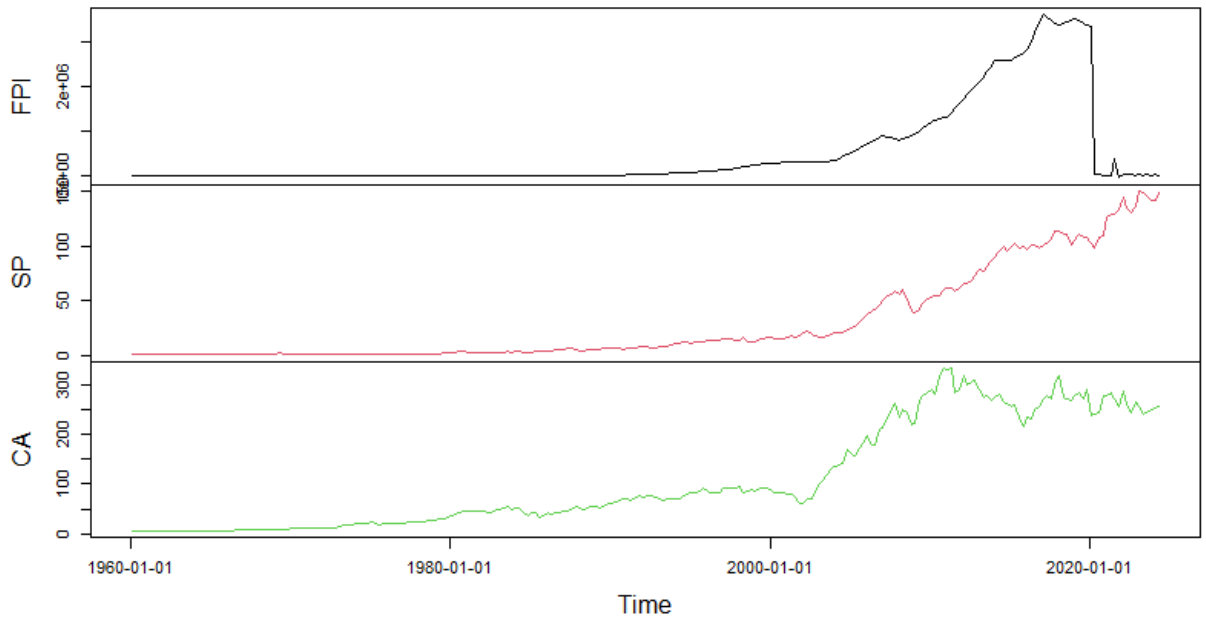

Figure 1. Movement of the variables over the study period.

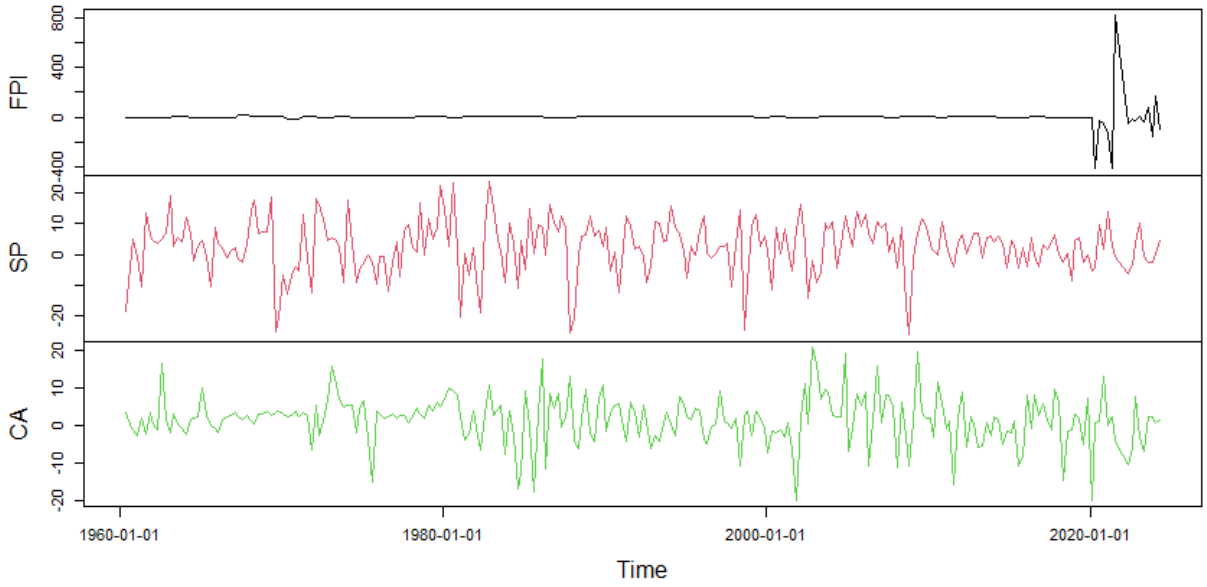

Figure 2. Plot of the variables in their differenced forms.

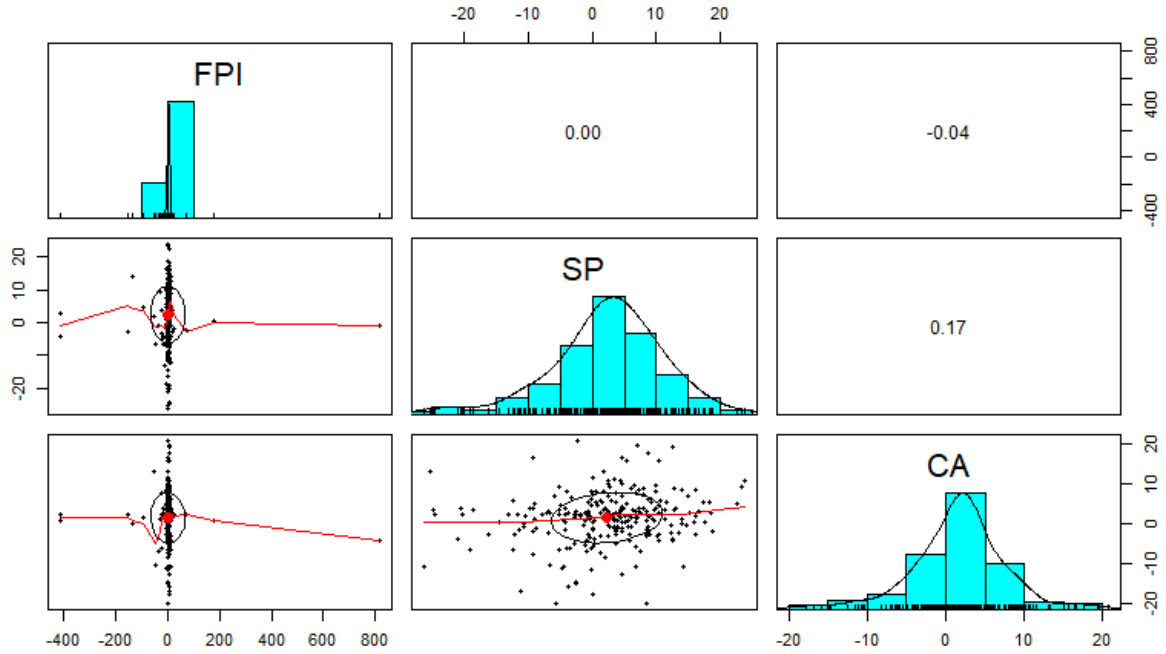

Figure 3. Plot of the pairwise correlation coefficients.

This study attempted to explore the intricate relationship between foreign portfolio investment, stock prices, and financial development in the South African economy using a dynamic conditional correlation (DCC GARCH model) and structural VAR estimation approach.

3.2. GARCH-DCC Model

Dynamic conditional correlation (DCC) is a multivariate model known as GARCH-DCC (Engle, 2001; Engle & Sokalska, 2012; Engle & Rangel, 2008; Engle, 1993).

To investigate time-varying correlations in contrast to static correlations, the DCC model is used. Using maximum likelihood estimation (MLE) techniques, the stated GARCH(p,q) model is estimated. The following equations serve as its representation, with r_t serving as a residual from the fitted VAR equation.

$$r_t = \theta_0 + \epsilon_t \quad (1)$$

$$\epsilon_t \sim \left(0, \sigma_t^2\right)$$

$$log\left(\sigma_t^2\right) = \alpha_0 + \sum_{j=1}^{p} \beta_j \, log\left(\sigma_{t-j}^2\right) + \sum_{i=1}^{q} \alpha_i \epsilon_{t-i}^2 \quad (2)$$

Since mean removal from the VAR residual series has already been performed, ϵ_t is then a standardised disturbance term. The function that yields the log of volatility for ϵ_t is its own lagged values and lagged standardised disturbance terms. β' stands for the GARCH effects, whereas α's indicates the volatility's persistence. The R statistics package uses the subsequent DCC variant for estimation:

$$Q_t = (1 - \alpha - \beta)\overline{Q} + \alpha z_t z_t' + \beta Q_{t-1} \quad (3)$$

where z_t is the residuals from GARCH's that has been standardized, β and α are the correlation coefficients which are persistent in nature, Q_t is the dynamic conditional correlation while $\overline{Q}$ is the original correlation matrix when $t = 0$ at $\overline{Q} = Q_{t=0}$. $Q_{t=0}$ is the time-varying correlation of GARCHS residuals that have already been standardized, which gives insight into the time-varying contemporaneous relationships amongst the variables.

3.3. Structural Vector Autoregression Model (SVAR)

A fairly broad method for modeling multivariate time series is the use of vector autoregressive (VAR) models. The inability of those models to characterize contemporaneous relationships between the variables under analysis is a significant flaw in their conventional form. This becomes a key concern in the impulse response analysis for these models, where understanding the immediate consequences of an economic shock is crucial. In order to address this, researchers typically use orthogonal impulse responses, where the (lower) Cholesky decomposition of the error covariance matrix yields the correlation between the errors. To do this, they must set up the model's variables in a suitable sequence. An alternative to this strategy is the employment of so-called structural vector autoregressive (SVAR) models, which more directly model the link between contemporaneous variables.

The reduced form of VAR model can be stated as follows:

$$y_t = A_1 y_{t-1} + \mu_t \text{ with } \mu_t \sim (0, \Sigma) \quad (4)$$

where y_t is a $k \times 1$ vector of k variables in period t. A_1 is a $k \times k$ coefficient matrix, $\in_t$ is a $k \times 1$ vector of errors, which have a multivariate normal distribution with zero mean as well as $k \times k$ variance-covariance matrix Σ. The variance–covariance matrix must be examined more thoroughly in order to comprehend SVAR models.

Covariances of the errors on the off-diagonal elements and variances of the endogenous variable on the diagonal elements are included. Information regarding the contemporaneous effects of each variable on the others is contained in the covariances. The components to the top-right of the diagonal (the "upper triangular") mirror the elements to the bottom-left of the diagonal (the "lower triangular"), indicating that the covariance matrices of typical VAR models are symmetric. The notion that the relationships between the endogenous variables simply represent correlations and do not permit claims of causal linkages is reflected in this. SVAR models, which place unique constraints on the covariance matrix and, depending on the model, on other coefficient matrices as well, are used to analyze contemporaneous causality, or more specifically, the structural links between the variables.

The SVAR model is estimated using the Zhang and Chen (2015) approach, which guarantees that the model is unaffected by unit-root issues and allows for the inclusion of

all variables in levels and an increase in the number of degrees of freedom. The estimated SVAR model with lag length p, SVAR(p), is stated as follows:

$$C_0 y_t = \prod_I y_{t-1} + \prod_2 y_{t-2} + \ldots + \prod_P y_{t-p} + \mu_t, \ t = 1, 2 \ldots . T. \quad (5)$$

where

$$y_t = \begin{pmatrix} FPI \\ SP \\ CA \end{pmatrix}, \ C_0 = \begin{bmatrix} 1 & -C_{12} & -C_{13} \\ -C_{21} & 1 & -C_{23} \\ -C_{31} & -C_{32} & 1 \end{bmatrix}, \ \prod_i = \begin{bmatrix} \gamma_{11}^{(i)} & \gamma_{12}^{(i)} & \gamma_{13}^{(i)} \\ \gamma_{21}^{(i)} & \gamma_{22}^{(i)} & \gamma_{23}^{i} \\ \gamma_{31}^{(i)} & \gamma_{32}^{(i)} & \gamma_{33}^{(i)} \end{bmatrix},$$

$$i = 1, \ 2, \ldots, p, \ \mu_t, = \begin{bmatrix} \mu_{1t} \\ \mu_{2t} \\ \mu_{3t} \end{bmatrix}$$

The SVAR model is sensitive to the lag length p, which is typically ascertained using AIC (Akaike information criterion) and SC (Schwarz criterion). The model's lag length (p) in this empirical effort is 2.

4. Results

4.1. Stationary Results

The stationarity of the underlying variables is assumed by many statistical tests. These tests may yield false results regarding the relationships between the variables if the variables are non-stationary. Hence, a time series' stationarity guarantees that its statistical characteristics, including its mean, variance, and autocorrelation, will not change over time. This enables models to produce consistent and trustworthy forecasts. To this end, we examined the stationarity properties of the variables using ADF and PP unit root tests as contained in Table 1. Our findings show that all our variables are stationary after first difference. This also confirms the evidence from the trend analysis.

Table 1. Unit root test results.

Variables	ADF *p*-Value		PP *p*-Value	
	With Intercept	**Without Intercept**	**With Intercept**	**Without Intercept**
FPI	0.0876	0.0712	0.0765	0.0000
SP	0.3781	0.6129	0.8174	0.0000
CA	0.3167	0.4123	0.24	0.0019
D(FPI)	0.0000	0.0001	0.00062	0.0003
D(SP)	0.00001	0.00003	0.0000	0.0000
D(CA)	0.0000	0.0000	0.0003	0.0000

4.2. DCC GARCH Results

The series' stationary property was investigated, and the variables have been established to be I(1). "DL" is appended to the level variable name to indicate differenced variables. A DCC GARCH model is then fitted to these differenced variables. Models were created for the DCC with multivariate skew Student-t distribution (sstd) and the DCC with multivariate Student-t distribution (std). However, the DCC with multivariate Student-t distribution was fitted for the study as it produced a lower Akaike information criteria.

The time-varying correlations amongst the variables are plotted in Figure 4. The dynamic correlation coefficient between foreign portfolio investment and stock prices are wholly positive with 0.15 being the highest coefficient and the lowest coefficient observed

in the mid 60s. Our findings also reveal that the highest coefficient is observed around the year 2020 and the subsequently began to fall. The fall in the relationship around this period could be attributed to the global economic closure due to the COVID-19 outbreak. The coefficient dropped from 0.15 around the pre-pandemic period to around 0.10 in 2024. Generally, the dynamic conditional correlation between foreign portfolio investment and stock prices is positive during the study period. This shows that while the stock prices and foreign portfolio investments move in the same direction, the relationship is weak for the whole period because the maximum correlation value was less than 0.5.

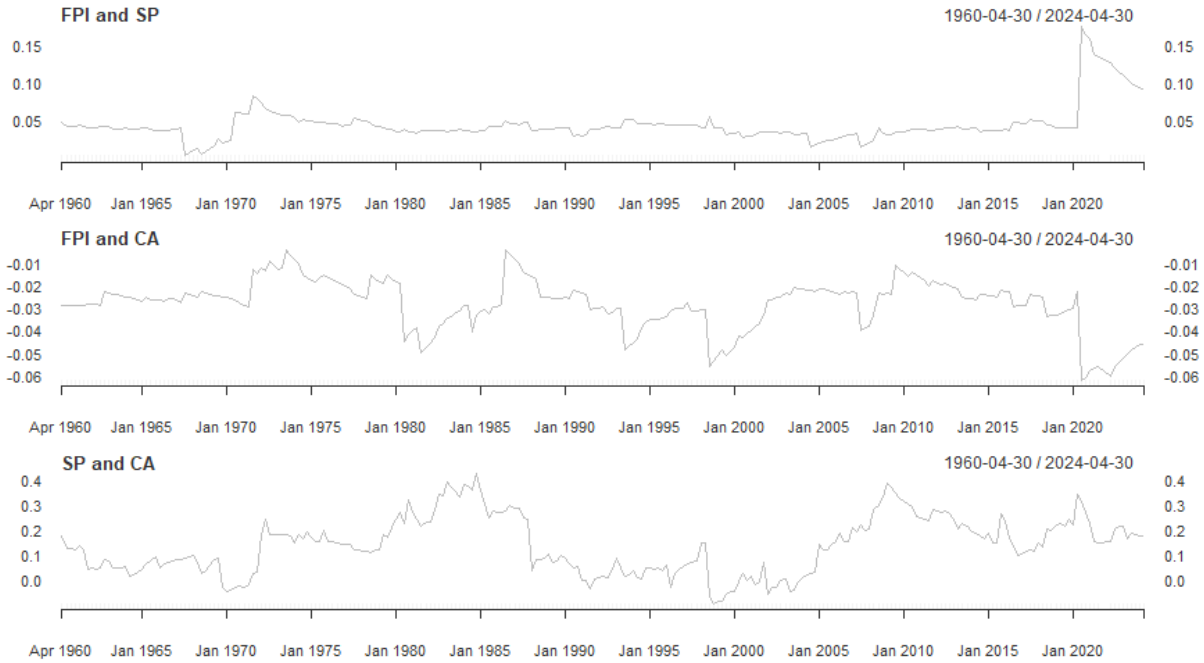

Figure 4. Time-varying correlation among the variables.

The dynamic correlation coefficients between foreign portfolio investment and credit allocated to private sector oscillates between −0.01 and −0.06. The implication is that the relationship between foreign portfolio investment and credit allocated to the private sector is negative and very weak. In other words, foreign portfolio inflow has not benefitted or aided the financial development and vice visa. The dynamic conditional correlation coefficients between stock prices and credit allocated to private sector oscillates in the positive region. Both variables are observed to move in the same direction. According to the empirical analysis, the South African economy's time-varying correlation between stock prices and credit allocated to the private sector during the course of the study period is not very strong.

4.3. Contemporaneous Restrictions, Stability Test, and Co-Integration Tests

With the SVAR(2) with 3 variables, the number of short run constrains will be

$$3(3-1)/2.$$

A stability test on the SVAR(2) model should be performed to demonstrate the model's stability before applying the impulse response function and variance decomposition. When there are no roots outside the unit circle, SVAR meets the stability requirement. In this study, the stability condition is satisfied.

The Johannsen Juselious (JJ) co-integration test is used to determine the co-integration relations among the variables once it has been previously established that the variables

are stationary following first differencing. The co-integration relationship between all the variables is demonstrated in this study using the JJ test. The reliability of SVAR(2) built in this research is strengthened by the presence of at least two co-integrating equations at the 0.05 level, as shown in Table 2. Otherwise, without the co-integrated relation of the variables, SVAR has no significance

Table 2. Co-integration test results.

Eigen Value	Trace Statistic	5 Percent Critical Value	Hypothesised NO of CE(s)
0.228992	63.14456	29.79707	None *
0.213390	33.49818	15.49471	At most 1 *
0.052398	6.135596	3.841466	At most 2
Eigen Value	**Max-Eigen Statistic**	**5 Percent Critical Value**	**Hypothesised NO of CE(s)**
0.228992	29.64638	21.13162	None *
0.213390	27.36259	14.26460	At most 1 *
0.052398	6.135596	3.841466	At most 2

Notes: Both the Trace test and maximum Eigen statistics indicate two co-integrating equations at five percent significant level; * denotes rejection of null hypothesis at 0.05 significant level; critical values are from Mckinnon–Haug–Michelis (1999); the results reported are based on the assumption of a constant and liner trend with an optimal lag length of 1.

4.4. Impulse Response Analysis

The results of impulse response analysis from SVAR modeling is presented in Figures 5–7. The impulse response analysis is used to assess the dynamic interactions between foreign portfolio investment, stock price and financial development, and empirical findings are discussed in the Figures below.

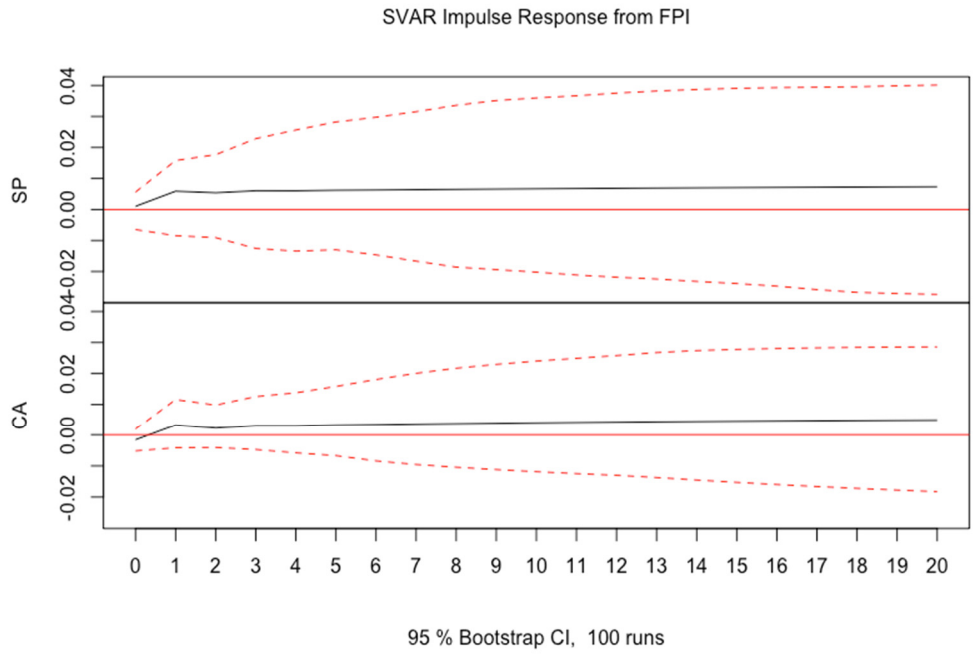

Figure 5. SVAR impulse response from FPI.

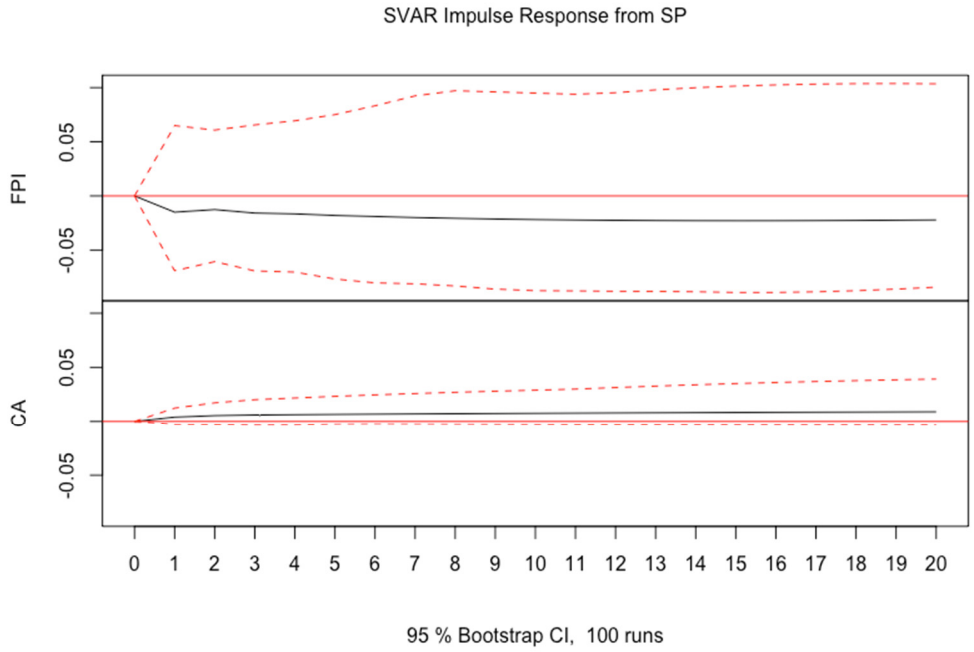

Figure 6. SVAR impulse response from stock price.

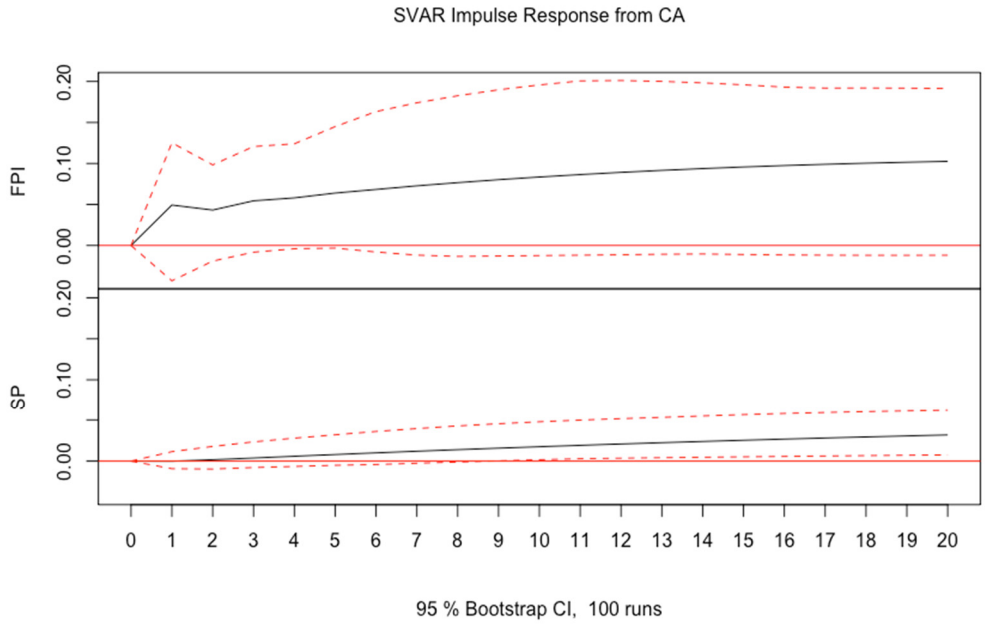

Figure 7. SVAR impulse response from financial development.

4.4.1. Response of the Variables to Foreign Portfolio Investment Shocks

The impulse response analysis shows that a positive shock to foreign portfolio investment expectedly leads to a positive response in the stock price. Stock prices are seen to positively respond to a shock in foreign portfolio investment. A positive shock to FPI causes an increase in stock prices because of the increased demand for domestic stocks. On the other hand, a positive shock to FPI is expectedly seen to also have an increasing effect on credit allocated to the private sector. However, the response is not found to be sufficiently large or material.

4.4.2. Response of the Variables to Stock Price Shocks

A positive shock to stock prices is observed not to have material effects on foreign portfolio investment. This is not expected as the increased stock price is expected to

boost foreign portfolio investment. However, the deduction and the implication from the empirical observation is that foreign portfolio investors look beyond stock prices in deciding their portfolio destinations. Other factors such as stable macroeconomic conditions and particularly strong institutions are often considered by most of the foreign portfolio investors. Similarly, it is also observed that a positive shock to stock prices does not have material effects on stock credit allocated to the private sector. A slight increase is noticed on the credit allocated to the private sector, but the rise is not significantly material.

4.4.3. Response of the Variables to Financial Development Shocks

Financial development shocks can be seen to promote and provoke significant inflow of foreign portfolio into the economy. The implication here is that foreign portfolio investments respond favourably and significantly well to positive shocks in financial development. As such, improved financial development is considered as a favourable factor by foreign portfolio investors in choosing their investment destination. Also, positive shocks to financial development can also be observed to have some positive and moderate effects on stock price. By implication, improved financial development slightly stimulates a positive rise in stock prices.

4.5. Forecast Error Variance Decomposition

Forecast error variance decomposition (FEVD) divides an endogenous variable's variation into the SVAR model's component shocks. To put it another way, variance decomposition provides insight into how each random innovation influences the variables in the VAR model. FEVD, in particular, gives details regarding the main causes of variation in each of the system's variables. According to previous empirical findings on FEVD, the "own" shocks are the primary cause of variation in all system variables, and our findings support this finding.

The FEVD result is presented in Figure 8. The empirical results show that the dominant sources of variation in all the variables are their own shocks. Each of the variable accounts for more than 99% variation in their respective shocks.

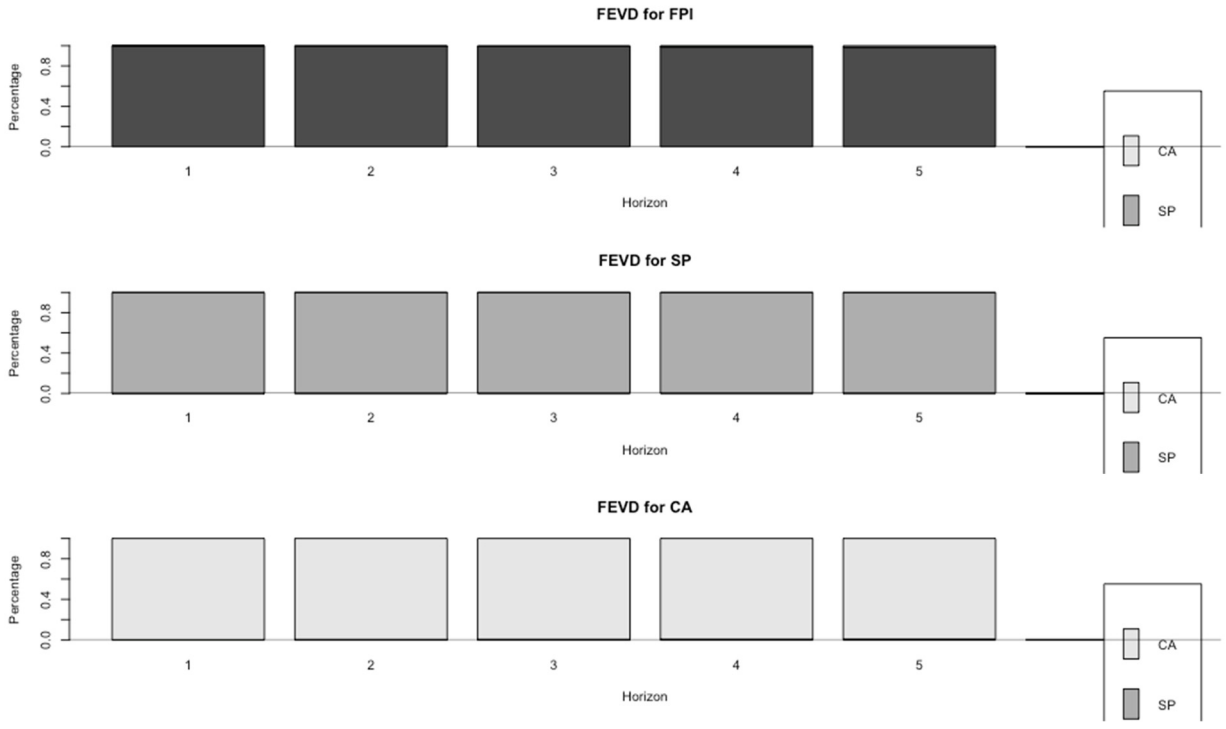

Figure 8. Forecast error variance decomposition.

Having ensured that our model passes diagnostic checks, the graphical forecast of all the three included variables is depicted in Figure 9. Other things being equal, we expect upward movement in the variables.

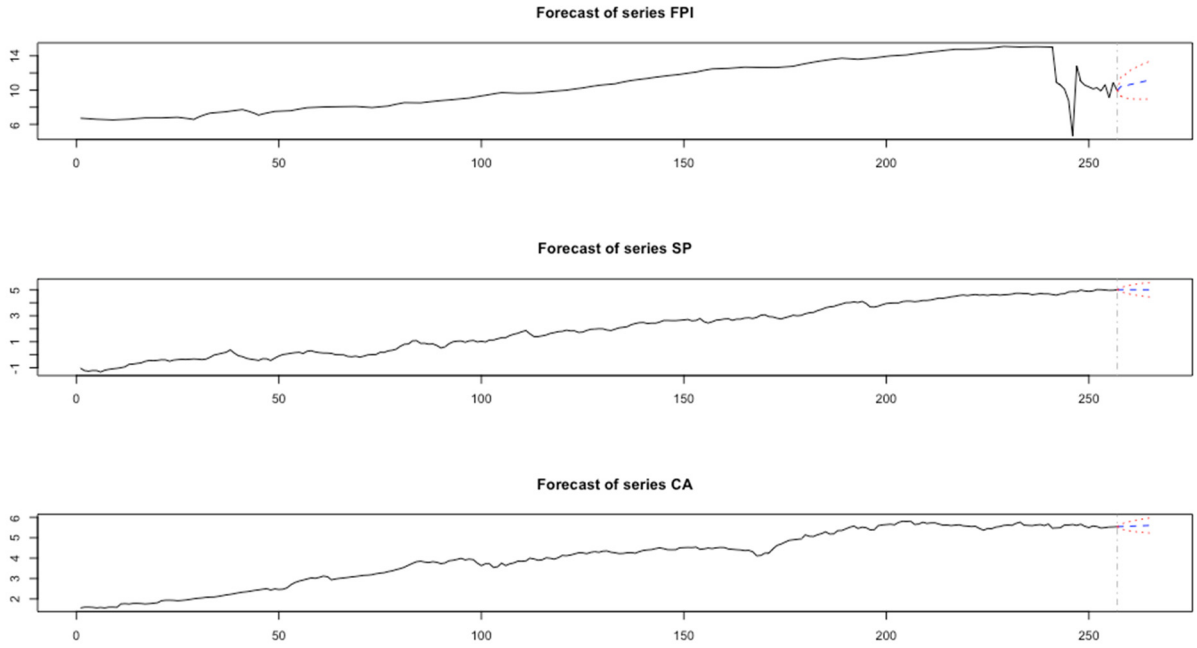

Figure 9. Forecast of all the variables.

5. Discussion

Our research indicates that foreign portfolio investments react favorably and significantly well to positive shocks in financial development, which means that foreign portfolio investors view improved financial development as a favorable factor when selecting their investment destination. Additionally, positive shocks to financial development have been found to have some positive and moderate effects on stock prices, which implies that improved financial development slightly stimulates a positive increase in stock prices.

This means that in South Africa, financial development plays a crucial role in mediating the impact of FPI on stock prices. A more mature financial system can better handle large foreign inflows, reducing the likelihood of destabilizing booms and busts in stock prices. Additionally, policies that foster financial development—like improving market regulations, enhancing transparency, and expanding financial access—can make FPI more productive by directing it towards sectors that drive sustainable economic growth rather than speculative investments. This empirical position is consistent with some studies in the literature, such as Otchere et al. (2016), Irandoust (2021), and Tongurai and Vithessonthi (2020) among others. However, our study differs from findings of Gebrehiwot (2016) and Sahin and Ege (2015) as they failed to find a meaningful link between financial development and foreign inflow.

In summary, while FPI can significantly boost stock prices and contribute to economic growth, it also poses risks, especially when financial development is insufficient to absorb and efficiently allocate these inflows. Thus, South Africa's policy environment must strike a balance between attracting FPI and strengthening its financial markets to ensure stable, long-term growth.

6. Conclusions

This study made an effort to investigate the contemporaneous relationship between foreign portfolio investment, stock prices, and financial development in the South African

economy. The study sheds light on how FPI affects stock market behavior and advances host economies' financial development and vice visa. Quarterly time series data spanning from 1960 (Q1) to 2024 (Q2) were sourced from Federal Reserve Economic Data (FRED). The study makes use of a dynamic conditional correlation (DCC GARCH model) and structural VAR estimation approach. Time-varying correlations between foreign portfolio investments, stock prices, and credit allotted to the private sector as a gauge of financial progress are shown by the DCC GARCH technique. The SVAR technique allows us to extract the contemporaneous shocks between stock prices, financial development, and foreign private investment (FPI).

The dynamic correlation coefficient between stock prices and foreign portfolio investment is entirely positive, with the lowest value recorded in the mid 60s and the highest coefficient at 0.15. Our results also show that the maximum coefficient was recorded around 2020, after which it started to decline. The dynamic correlation coefficients between loans allotted to the private sector and foreign portfolio investments fluctuate between -0.01 and -0.06. It is implied that there is a weak and negative correlation between loans given to the private sector and overseas portfolio investments. In other words, the financial development has neither benefited nor been supported by the inflow of foreign portfolios, and vice versa.

The stock price and the credit given to the private sector have dynamic conditional correlation coefficients that fluctuate in the positive range. It is seen that both variables are moving in the same direction. The empirical analysis indicates that time-varying association between the stock price and the amount of credit given to the private sector in the South African economy throughout the course of the study period is not significant.

According to the impulse response analysis, a positive shock to foreign portfolio investments is likely to cause the stock price to rise. Shocks to foreign portfolio investments are observed to have a favorable impact on stock prices. It is found that a positive shock to FPI increases the amount of credit given to the private sector. Nonetheless, the response is deemed insufficiently substantial. Foreign portfolio investments are found to be unaffected materially by a positive stock price shock. This is not anticipated because higher stock prices are supposed to encourage foreign portfolio investment. Nonetheless, it may be inferred from the empirical observation that foreign investors consider factors other than stock price when choosing investment destinations for their funds. In a similar vein, it has been noted that credit allotted to the private sector is not much impacted by positive stock price shocks. It is believed that a financial development shock encourages and provokes a substantial influx of foreign portfolio investment into the economy. This suggests that overseas portfolio investments react favorably and notably well to favorable shocks in the financial development process. Therefore, when picking an investment site, foreign portfolio investors view greater financial development as a beneficial feature. Additionally, positive shocks to financial development have been shown to have some moderately beneficial effects on stock prices. Additionally, the empirical results demonstrate that their own shocks are the primary sources of variation in all the variables. Every variable explains over 99 percent of the variation in the corresponding shocks.

The study concluded that sound macroeconomic policies, a favorable macroeconomic environment, and strong institutions must be ensured in order to stimulate more foreign portfolio investments as foreign portfolio investors do not singularly consider stock prices. Similarly, in order to boost the impact of a positive shock to stock prices on credit allocated to the private sector, this study recommends that sound financial system framework and a reduced cost of credit would ensure that increased stock prices have positive effects on other financial development indicators. Consequently, improved financial develop-

ment indicators such as credit allocated to the private sector will in turn boost foreign portfolio investment.

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