"Impact of money supply and macroeconomic indicators on foreign portfolio investment: Evidence from Vietnam"

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BUSINESS PERSPECTIVES

Nguyen Thi Dieu Chi, Doctor, Senior Lecturer, School of Banking and Finance, Department of International Finance, National Economics University, Vietnam.

Nguyen Thi Dieu Chi (Vietnam)

IMPACT OF MONEY SUPPLY AND MACROECONOMIC INDICATORS ON FOREIGN PORTFOLIO INVESTMENT: EVIDENCE FROM VIETNAM

Abstract

This study examines the relationship between money supply, macroeconomic indicators, and foreign portfolio investment in Vietnam. Using the Autoregressive Distributed Lag Model and Stata 17 software to analyze quarterly data from Q1/2007 to Q4/2022, the analysis reveals strong and enduring correlations. An increase in money supply and economic growth positively influences foreign portfolio investment, with the money supply from the previous quarters significantly impacting foreign portfolio investment (P-value < 0.01). However, foreign exchange rates and foreign direct investment negatively affect foreign portfolio investment. Three macroeconomic indicators show significance at 1% and 5%, where gross domestic product positively affects foreign portfolio investment, while foreign exchange rates and foreign direct investment have detrimental impacts. The findings indicate that a 1% increase in gross domestic product leads to a USD 50.426 million increase in foreign portfolio investment, while a USD 1 million increase in foreign direct investment results in a USD 0.025 million decrease. Foreign exchange rates significantly affect foreign portfolio investment, with the potential for reduction through VND devaluation or an increase in the VND/USD exchange rate due to government adjustments. Definitive conclusions about external debt, interest rates, and inflation require additional data and research. The study's R-squared value is 0.2738, with an adjusted R-squared of 0.1813, explaining 27.38% of future changes in Vietnam's foreign portfolio investment. These findings have important implications for policymakers, suggesting that expanding the money supply and implementing suitable interest rate policies could enhance foreign portfolio investment attractiveness in the nearest term.

INTRODUCTION

Since 2008, wealthier nations like the UK, US, some countries in EU area, and Japan have used quantitative easing measures, leading to significant capital inflows into developing economies, including Vietnam. However, investors withdrew capital when these countries raised interest rates to control growth and inflation. In response, emerging economies like Vietnam also raised interest rates to protect their currencies and control inflation. Global economic conditions and macroeconomic indicators in emerging nations influence this capital flow volatility. Vietnam's current and future economic growth heavily depends on foreign investment capital, and foreign portfolio investment (FPI) is one of those foreign sources. Evaluating how factors like money supply, interest rates, external debt, and macroeconomic indicators might affect Vietnam's capital flows is crucial. FPI has significantly grown in Vietnam, particularly since it entered the World Trade Organization in 2007. Like other emerging nations, foreign investment capital is

crucial for Vietnam's economic progress. FPI played a vital role in boosting investment capital, driving socio-economic development, and improving the financial market. Therefore, studying the factors influencing FPI is essential to attracting FPI and diversifying investment opportunities for domestic and foreign investors.

1. LITERATURE REVIEW

Foreign portfolio investment, the movement of financial assets across borders, has long interested academics. After the 2008 financial crisis, there was a substantial shift in FPI inflows from developed to emerging markets. This shift helped stabilize the capital and stock markets of host countries. However, various economic factors significantly influence FPI, and findings can vary across different periods and regions. Numerous studies by Agarwal (1997), Portes and Rey (1999), Darby et al. (1999), Carrieri et al. (2004), Lee and Yoon (2007), Thompson (2008), Kodongo and Ojah (2012), Ahmad et al. (2015), and Koepke (2018) consistently highlight the positive impact of financial indicators on FPI. These indicators include interest rates, external debt, exchange rates, and other economic variables. For example, Agarwal (1997) found a positive correlation between exchange rates and FPI inflows. Darby et al. (1999) revealed that increasing exchange rates and foreign direct investment boost FPI inflows.

Investors turn to FPI to gain capital while avoiding direct control over its use, seeking high returns and risk diversification. The depreciation of the host country's currency attracts foreign investors looking for higher profit margins. Other studies by Bleaney and Greenaway (2001), Bekaert and Harvey (2002), and Gordon and Gupta (2003) have also identified substantial correlations between interest rates, currency values, exchange rates, and various financial indicators with FPI inflows in different nations. FPI is critical to a country's economic development and expansion of the global stock market. It is a capital source for developed and developing nations, allowing diversification and ownership in multinational corporations. When assessing investment opportunities, portfolio investors consider exchange rates, money supply, interest rates, and foreign debt levels. Countries with low interest rates, high inflation, and limited economic growth may struggle to attract FPI investors, while those with higher deposit rates are seen as offering more profit potential.

The relationship between FPI and economic factors such as currency value, foreign exchange rates, and foreign direct investment is well-established (Lee & Yoon, 2007). Various elements impact foreign investment flows, including market trends, international financial integration, profit margins, deposit rates, and production facilities. As cross-border investments and global trade expand, so do investors' profit expectations from FPI. Economic variables are critical in shaping an economy's development by attracting foreign investment and FPI capital. An appropriate increase in the money supply can spur economic growth and make a nation more attractive to foreign investors. However, excessive money supply growth can lead to inflation. Therefore, countries must consider other financial indicators like inflation, exchange rates, and GDP growth rates when targeting FPI. In specific cases, the money supply can negatively affect FPI. Changes in exchange rates, inflation, and foreign sources also influence FPI capital flows within a country. Researchers like Thapa and Poshakwale (2009), Choong and Lam (2010), and Ahmad et al. (2015) have underlined the importance of these economic factors in attracting foreign portfolio investments, shedding light on the significance of external debts and interest rates in different contexts.

Several studies have explored the multifaceted impact of economic factors on FPI. Yang et al. (2013) examined 13 developing nations in Asia and Latin America from 1981 to 2011, revealing a negative relationship between monetary policies, money supply, exchange rates, stock market volatility, and FPI in growing Asian economies. Onuorah and Akujuobi (2013) focused on Nigeria from 1980 to 2010, emphasizing the significant correlation between FPI and financial indicators like money supply, interest rates, external debt, and economic growth. Further studies delved into FPI's dynamics. Taylor and Sarno (1997), Agarwal (1997), and Ramzan et al. (2013) identified a negative correlation between foreign direct investment, foreign exchange rates, and FPI inflows.

In contrast, Kodongo and Ojah (2012) established a positive association between FPI and foreign exchange rates. Stability in political environments, currency values, money supply, and financial indices were underlined by Smimou (2014) and Waqas et al. (2015) as significant factors in attracting FPI. Garg and Dua (2014) observed a substantial increase in FPI in developing nations, particularly China, Brazil, South Africa, and India, attributing it to macroeconomic policies focused on openness and internationalization. China, notably the world's leading recipient of foreign indirect investment, underwent a surge in FPI following agricultural reforms in 1978. The appeal of financial indices significantly influences FPI, especially in emerging economies. Waqas et al. (2015) employed a GARCH regression model to examine the impact of economic variables, highlighting the importance of stable economic factors in reducing FPI volatility and attracting investments. Ahmad et al. (2015) found comparable results in the Chinese market, emphasizing the role of external debt. Studies in Turkey by Pala and Orgun (2015) and in the Asian market by Anggitawati and Ekaputra (2018) reached similar conclusions, finding factors like exchange rates, inflation rates, stock market developments, and market openness as critical influencers of FPI capital flows. Moreover, Shabbir and Muhammad (2019) and Huang et al. (2021) corroborated these findings, highlighting the importance of a host country's economic conditions and financial indicators in stimulating FPI and fostering economic growth. Research in China, India, Pakistan, and Sri Lanka explored how currency value, interest rates, and economic growth affect FPI volatility. The results indicated that these factors influence the volatility of international portfolios under specific circumstances. Stable financial indicators are essential for attracting foreign investors and reducing FPI volatility. This finding underscores why an increase in China's currency value leads to decreased business profitability and increased FPI fluctuations. Ahmad et al. (2015) and Kartal et al. (2022) studied factors influencing FPI, including market efficiency, capital size, external debt, foreign exchange rates, and economic growth rates. Higher profit expectations significantly contribute to FPI inflows. Stable macroeconomic conditions are vital to attracting reliable capital flows. In the Chinese market, external debt appears as the primary driver of FPI inflows, with economic growth and exchange rates also exerting significant influence. Ezirim et al. (2022) examined the relationship between financial indicators (external debt, money supply, inflation, economic growth, and interest rates) and FPI volatility in India, China, Pakistan, and Sri Lanka. They discovered an inverse link between inflation and FPI in Pakistan, India, and China. Furthermore, exchange rate variables positively impacted FPI in the Chinese market, while economic growth negatively correlated with FPI volatility. Interest rates also influenced FPI volatility, as foreign investors sought higher actual yields in other countries due to unfavorable interest rate comparisons with host countries.

The research examines macroeconomic indicators' impact on foreign investment capital in Vietnam, specifically the money supply, interest rates, and external debt. There is a need for a comprehensive study of these factors' effects on foreign portfolio investment in emerging countries like Vietnam. As a result, this study addresses these gaps. It analyzes how the money supply, interest rates, external debt, and financial indices such as economic growth, inflation, foreign exchange rate, and foreign direct investment influence foreign portfolio investment flows in Vietnam. The research utilizes data from Q1/2007 to Q4/2021, a period of significant economic development in Vietnam after joining the World Trade Organization. These findings can be an example for other developing or emerging countries during their market opening processes.

2. RESEARCH METHODOLOGY AND DATA

This study investigates the impact of money supply and macroeconomic indicators on foreign portfolio investment in Vietnam. The research ensures data stability using the Augmented Dickey-Fuller Test (ADF) by Dickey and Fuller (1979). Autoregressive Distributed Lag (ARDL) accounts for non-stationarity at different levels. The ARDL model combines the least squares regression (OLS) and vector autoregression (VAR) models, making it a productive, adaptable, and simple multivariate time series analysis tool. It has the appropriate functional form, no autocorrelation, variable var-

iance, and stationary time series variables. Stata 17 software is utilized for data analysis. The study applies the ARDL model to assess the effects of selected factors on foreign portfolio investment in Vietnam as follows:

$$FPI = \alpha_0 + \alpha_1 MS + \alpha_2 IR + \alpha_3 EDGDP + \\ + \alpha_4 GDP + \alpha_5 INF + \alpha_6 FX + \alpha_7 FDI + \varepsilon, \quad (1)$$

where *FPI*: Foreign portfolio investment of Vietnam; *MS*: Money supply or board money of Vietnam; *IR*: The deposit interest rate of Vietnam interbank in 3 months; *EDGDP*: A percentage rate of external debt in Gross Domestic Product; *GDP*: Economic growth rate of Vietnam; *INF*: The rate of inflation in Vietnam; *FX*: Foreign exchange rate between USD and VND; and *FDI*: Foreign direct investment inflow in Vietnam.

The analysis used quarter data in Vietnam from Q1/2007 to Q4/2022. The study gathered data on foreign portfolio investment (FPI), money supply (MS), deposit interest rate (IR), external debt (EDGDP), economic growth rate (GDP), inflation rate (INF), foreign exchange rate (FX), and foreign direct investment (FDI) from Vietnam State Bank, Vietnam Stock Market, the World Bank, the IMF, and the Vietnam Gross Statistic Organization.

Foreign Portfolio Investment: FPI inflows often allow investors to implement their portfolios by combining different investment securities portfolios across multiple markets. Foreign indirect investment is the purchase of financial assets between nations for ownership stakes in multinational corporations. Due to its role in international capital flows, FPI facilitates the profitable cross-border movement of financial assets like cash, equities, and bonds.

Money Supply: Increased board money enhances the capitalization of listed companies in the domestic market, building international companies' confidence (Mugableh, 2015; Thwaini & Hamdan, 2017; Kartal et al., 2022).

Interest Rate: Interest rate differentials significantly impact portfolio flows to developing nations. Due to the disparities in the current interest rates on global markets, money tends to flow to nations with high interest rates (Edo & Kanwanye, 2022).

External Debt: The country's external debt significantly negatively affected foreign portfolio investments (Ahmad et al., 2015).

Economic Growth: Changes in foreign portfolio investment result from economic growth. The country's economic success is the main draw for luring foreign investors (Kartal et al., 2022). High growth rates are crucial to divert foreign capital flows to appearing countries. Portfolio investments by foreign investors are made in countries whose economies are growing. Foreign investors invest in developing countries to increase their access to markets.

Inflation: Potential foreign portfolio investors will leave nations with high inflation because they fear losing returns and their original investment. Therefore, inflation affects attracting FPI into a nation (Al-Smadi, 2018; Batarseh, 2021).

Foreign Exchange Rate: According to Garg and Dua (2014), Anggitawati and Ekaputra (2018), and Nguyen and Dang (2022), the devaluation of the local currency has a significant impact on the value of the return on investments, which discourages possible foreign portfolio investments. Conversely,

Table 1. Variable and hypothesis

Variables name	Variable	Measurement	Hypothesis
Dependent variable			
Foreign Portfolio Investment	FPI	Million USD	–
Independent variable			
Money Supply	MS	Million Billion VND	+
Deposit Interest Rate (3 months)	IR	% per year	+
External Debt	EDGDP	A percentage rate of external debt in GDP (%)	+
Economic Growth Rate	GDP	%	+
Inflation	INF	%	–
Foreign Exchange Rate	FX	The foreign exchange rate between USD and VND	–
Foreign Direct Investment	FDI	Million USD	–

a rise in the local currency's value raises the confidence of potential foreign portfolio investors in the economy.

Foreign Direct Investment: Hailu (2010) and Tran and Dinh (2013) asserted that direct foreign investment inflows impact international portfolio investments. According to the same study by Nguyen (2022), foreign direct investment can stabilize the macroeconomic system and reduce the volatility of foreign portfolio investments.

3. RESEARCH RESULTS AND DISCUSSION

Descriptive statistics provides basic descriptions for the chosen variables. It has minimum and maximum as well as mean and standard deviation. The mean represents the data set. The standard deviation also illustrates how each variable deviates from its mean.

Table 2. Descriptive statistics of macro-economic variables

Variable	Mean	Std. dev	Min	Max
FPI	562.92	523.92	12	2065.55
MS	6.27	4.10	1.25	13.88
IR	6.78	3.82	1.66	15.67
EDGDP	41.68	9.79	23.64	63.46
GDP	5.52	2.35	-6.71	12.67
INF	1.64	1.93	-0.91	8.93
FX	20986.5	2439.49	16074	23612
FDI	4655.94	4204	1300	29600

Table 2 presents descriptive statistics of FPI inflows, MS, IR, EXGDP, and four other financial indices in Vietnam. Financial information was collected from quarterly Q1/2010 – Q4/2022 reports. The findings showed that the average foreign portfolio investment inflow in Vietnam for the sample is 560.92 million USD. The minimum and most significant values of FPI are 12 million USD and 2065.55 million USD, respectively, with a standard deviation of 523.92 million USD. Since Vietnam's official entry into the World Trade Organization in 2007, foreign portfolio investment flows into Vietnam have altered dramatically.

Since 2007, Vietnam has seen a sharp growth in foreign indirect investment. From USD 1091 million in Q1/2007 to USD 2065 million in Q4/2022.

However, there is a significant disparity because, after the world financial crisis, most foreign investment funds and many foreign investors have withdrawn capital from Vietnam, causing a severe decline in FPI resources in the economy. These reasons cause the most significant and smallest FPI values to have large differences and high standard deviations, the same results with money supply and interest rate. The standard deviations of these variables are rather large. The mean value of the money supply is 6.27 million billion VND, and the standard deviation is 4.10 million billion VND. At the same time, the minimum and maximum money supply are 1.25 million billion VND and 13.8 million billion VND, respectively. Vietnam's deposit interest rate of interbank in 3 months is 6.78% on average, while the average inflation is 1.64%. This finding is a reasonable interest rate in Vietnam in attracting foreign investment capital. It can explain a part of the substantial increase of foreign capital in Vietnam from 2007 until now.

The study incorporates control independent variables such as the economic growth rate, inflation, foreign currency rate, and foreign direct investment. Their respective mean values are 5.52 percent, 1.64 percent, 20,986.5 Vietnamese dongs, and USD 4,655.94 million. These variables exhibit significant variation between their maximum and minimum values, alongside high standard deviations. The research spans from Q1/2007 to Q4/2022, aligning with Vietnam's government policies to attract foreign capital, which has played a vital role in the country's socio-economic development during the past three decades. This contribution has led to sustained economic growth, lower capital costs, enhanced market competition, technological advancements, improved management practices, and increased market liquidity, thereby bolstering the efficiency of stock markets.

The link between the chosen independent financial indices was evaluated using correlation analysis. The best method for deciding the strength of a linear relationship is to use Pearson Correlation because all the chosen independent variables are continuous. Also, deciding the degree of linear connection and statistical significance of the independent variables is crucial.

Table 3. Correlation between independent variables

Variables	FPI	MS	IR	EDGDP	GDP	INF	FX	FDI
FPI	1.0000	–	–	–	–	–	–	–
MS	0.0663	1.0000	–	–	–	–	–	–
IR	−0.0841	−0.6871	1.0000	–	–	–	–	–
EDGDP	−0.0147	0.1350	−0.1740	1.0000	–	–	–	–
GDP	0.1498	−0.1587	0.1547	−0.0752	1.0000	–	–	–
INF	0.1502	−0.4879	0.6285	−0.0483	0.1878	1.0000	–	–
FX	−0.2105	0.6352	−0.6272	0.3305	−0.1130	−0.5569	1.0000	–
FDI	0.0170	−0.1392	0.4321	−0.3770	0.0860	0.4331	−0.3725	1.0000

Table 3 analyzes the multi-co-linearity problem among the selected independent variables (MS, IR, EDGDP, GDP, INF, FX, and FDI). The values of correlation among independent variables are from −0.6871 to 0.6258. A correlation of 0.7 and above stands for a high correlation. However, the above data with correlation values are less than 0.7, even though the findings are less than 0.2. The low correlation coefficients express no multicollinearity problems in the research model. Selected variables are suitable for analyzing the impact of chosen variables on the FPI of Vietnam from 2007 to 2022, as well as predictions for the future of the Vietnam market.

The study checks the stationary of variables at the same level. The data are analyzed using the unit root Augmented Dickey-Fuller test created by Dickey and Fuller (1979) to find the long-run and short-run coefficients of the money supply and financial indices on the FPI of Vietnam to determine if the absolute value of the statistical variable went below the equivalent relevance in the initial sequence. The influence of MS, IR, EDGDP, and four control variables on FPI in Vietnam from Q1/2007 to Q4/2022 was then studied using the Autoregressive Distributed Lag Model (ARDL).

It is needed to evaluate the unit root of the variables because this study uses time series explanatory variables. The ADF test results are shown in Table 4. Only the money supply (MS) is smaller than the critical value among the determined ADF test values. Other independent variables, in contrast, are larger than the crucial value. This result proves that, except for the money supply variable, the null hypothesis of the existence of selected variables was accepted at a 5% significance level. Only MS is non-stationary, while IR, EDGDP, GDP, INF, FX, and FDI are stationary at levels. Meaningful inferences concerning a non-stop unit root were drawn from the inspection data. The variables were discovered to be stationary when the ADF test was performed with a 5% difference. As a result, additional investigation of these factors is considered appropriate. When calculating each variable's influence and stationary location in the time series, the latency of each variable plays a critical role. In this case, MS is non-stationary. Therefore, the study continues testing stationary money supply with lag in the short term. The study continues utilizing VAR (vector autoregression model) and the AIC (Akaike information criterion) as the primary standards to assess the lag of MS before completing the ARDL model to determine the appropriate lag order.

Table 4. Stationary test

Variable	Augmented Dickey-Fuller Unit-Root Test of Stationarity					Test results
	Test statistic	Prob.	Critical value			
			1%	5%	Status	
FPI	−5.748	0.0000	−2.389	−1.970	−1.296	Stationary
MS	0.820	0.7923	−2.389	−1.970	−1.296	Non-stationary
IR	−1.737	0.0437	−2.389	−1.970	−1.296	Stationary
EDGDP	−7.323	0.0000	−2.389	−1.970	−1.296	Stationary
GDP	−5.105	0.0000	−2.389	−1.970	−1.296	Stationary
INF	−3.849	0.0001	−2.389	−1.970	−1.296	Stationary
FX	−2.020	0.0239	−2.389	−1.970	−1.296	Stationary
FDI	−4.697	0.0000	−2.389	−1.970	−1.296	Stationary

Table 5. Lag length selection of MS

Lag	LL	LR	AIC	HQIC	SBIC
0	−648.02	NA	20.9684	20.9953	21.037
1	−503.385	289.27*	16.4318	16.5126*	16.6376*
2	−499.011	8.7477	16.4197*	16.5544	16.7628

Note: * indicates lag order selected by the criterion.

According to Table 5, MS has the second lag. This result indicates that the money supply has a maximum lag of 2 for the model. The test procedure was then used to eliminate the mismatch latency and deliver the best latency. Therefore, MS with lag at second is the endogenous variable or independent variable. The second lag is still suggested by the findings from the LR (Sequential modified LR test statistic), AIC (Akaike information criterion), HQIC (Hannan-Quinn information criterion), and SBIC (Schwarz information criterion) (significant at the 5% level). This result indicates that the model's maximum latency for MS is two. As a result, all the independent variables may be utilized to analyze the model because they are all trustworthy and steady. After checking the lag length of variables in the model, the autoregressive distributed lag study proves a long-run relationship between Vietnamese foreign portfolio investment and selected independent variables. Additionally, the study made it possible to predict future times by comparing the effects of financial indices like economic growth, inflation, foreign exchange rate, and foreign direct investment to the effects of money supply, interest rate, and external debt on foreign portfolio investment.

Table 6. Regression coefficients of Autoregressive Distributed Lag Model

Variable	Coefficient	Std. Error	Prob.
MS (−2)	131.897***	35.377	0.000
IR	6.591	25.888	0.312
EDGDP	10.518	7.445	0.163
GDP	50.426*	26.412	0.061
INF	3.185	44.046	0.243
FX	−0.243***	0.059	0.000
FDI	−0.025*	0.019	0.020
R-squared		0.2738	
Adj R-squared		0.1813	

Note: ***, **, and * indicate significance levels at 1%, 5%, and 10%, respectively.

The findings from Table 6 with the results from the ARDL model showed that FPI inflows into Vietnam are notably positively influenced by the money supply and economic growth. At the same time, FPI is negatively impacted by the foreign exchange rate and foreign direct investment. However, external debt, interest rates, and inflation should have more evidence for practical conclusions. Moreover, the money supply in the two previous quarters will impact Vietnam's foreign portfolio investment because the P_value is less than 0.01. Alternatively, change in MS will have a positive statistically significant impact on FPI in the future. Table 6 data indicates a direct relationship between a 1 million billion VND increase in the money supply (MS) of the two previous quarters and a 131.897 million USD rise in foreign portfolio investment (FPI) in Vietnam. This finding aligns with the research of Agarwal (1997), Wang (2009), Choong and Lam (2010), and Ayomi et al. (2021), who also found that FPI tends to increase with a higher money supply. However, the government must balance this approach since excessive monetary expansion can lead to currency devaluation and long-term macroeconomic instability. The debate between prioritizing growth or stability in monetary policy still needs to be solved, especially in emerging and developing nations. These findings are significant for Vietnam's development, as it relies on foreign capital. The Vietnamese government, notably the Vietnam State Bank, should consider these results when formulating monetary policies. Regarding interest rates and external debt, the data suggests their insignificance, but they might still indirectly impact specific macroeconomic issues and FPI in Vietnam, needing further investigation. Three out of four financial indices are significant, with GDP positively affecting FPI, while foreign exchange (FX) and foreign direct investment (FDI) have negative impacts. This finding is supported by Amjed and Shah (2021). Specifically, a 1% increase in GDP results in a 50.426 million USD FPI increase, while a 1 million USD FDI increase leads to a 0.025 million USD FPI decrease. FX has a high impact on FPI, implying that VND devaluation or an increased VND-USD exchange rate reduces FPI. These findings echo those of Ahmad et al. (2015), Kartal et al. (2022), and Ezirim et al. (2022) regarding the influence of exchange rates on FPI.

Moreover, the depreciation of the local currency will cause investors to worry about declining returns, thus reducing their FPI investment in

that country (Ahmad et al., 2015; Anggitawati & Ekaputra, 2018). In this case, the devaluation of the VND will reduce the incentive for foreign investors to invest in FPI in Vietnam in the future. These findings are essential for the Vietnamese government to issue suitable foreign exchange rate policies. However, the inflation variable was not statistically significant in assessing the impact of inflation on FPI flows into Vietnam. However, inflation directly affects the attraction of foreign investment flows to countries in general and Vietnam in particular. Therefore, more than the study is needed to conclude the relationship between inflation and FPI in Vietnam during the study period and predictions for the following periods. Besides, the value of R2 is 0.2738, and the adjusted R2 is 0.1813. It means that all independent variables in the model can impact about 27.38% and 18.13% of the change in Vietnam's foreign portfolio investment in the future.

To test the accuracy of the results of the regression model as well as the significance of the selected model, the study conducted two kinds of tests, the Durbin-Watson test and the Breusch-Godfrey test, to consider the impact of money supply and three financial indices like GDP, FX, and FDI on Vietnam's foreign portfolio investment in the period from Q1/2007 – Q4/2022. The test result of Durbin-Watson is d-statistic (8,64) = 2.020688.

It indicated that if the value of the d-statistic is more significant than 1 and smaller than 3, or if $1 <$ d-statistic < 3, then conclude that the model has no self-correlation—alternatively, the selected model is suitable to explain the problem.

Table 7. Breusch-Godfrey test

lags(p)	chi2	df	Prob > chi2
1	0.517	1	0.4720
H0: No serial correlation			

The Breusch-Godfrey Test in Table 7 yields the same conclusion as the Durbin-Watson test; the model is not subject to self-correlation. Additionally, the chi-squared is 0.517, and the P-value is more significant than 0.05, indicating no serial correlation in the model. This outcome also fits the study's needs and ensures the correctness of the model used. The study shows that money supply and selected financial indices impact Vietnam's foreign portfolio investment. However, there needs to be more evidence and data to prove the impact of interest rates, external debt, and inflation on Vietnam's foreign portfolio investment in the following quarters. The study's results demonstrate the suitability and dependability of the ARDL model for assessing the impact of the money supply, economic growth rate, foreign exchange rate, and foreign direct investment on Vietnam's foreign portfolio investment.

CONCLUSION

The ARDL Model assesses the impact of Money Supply, Interest Rate, External Debt, Economic Growth Rate, Inflation Rate, Foreign Exchange Rate, and foreign direct investment on Vietnam's foreign portfolio investment. The findings indicate a positive correlation between Money Supply, Economic Growth Rate, and Foreign Portfolio Investment. Foreign currency rates and foreign direct investment abroad negatively affect foreign portfolio investment overseas. However, more data is needed for specific conclusions on inflation's impact. These findings have implications for attracting foreign capital in developing and emerging countries, particularly the post-2008 global financial crisis. Many countries increased their Money Supply through quantitative easing after the crisis, attracting foreign investment, but later had to use interest rates to combat inflation. Factors like Money Supply, Interest Rates, External Debt, and financial indicators in developing and emerging countries significantly influence international money transfers. Recognizing the interplay between internal and external factors affecting capital flows is crucial for Vietnam's economic growth. These findings reflect common trends in emerging and developing markets.

The study uses quarterly data from Q1/2007 to Q4/2022 to analyze the FPI impact in Vietnam with financial indices like money supply, interest rate, external debt, economic growth rate, inflation rate, foreign exchange rate, and foreign direct investment inflow. Other indices, such as the stock index, fi-

nancial development index, and trade openness, may be explored in other studies or emerging countries. Further research could gain deeper insights by incorporating high-frequency data (monthly, weekly, daily). Additionally, competent authorities must monitor and predict abnormal fluctuations in the financial system, especially with changes in economic policies in developed nations. This paper is a resource for international investors and governments considering investments in Vietnam or similar emerging markets. Money supply and economic growth significantly influence FPI, and foreign exchange rates and foreign direct investment should be considered. Researchers can also include additional variables to explain the remaining FPI impact, as the current model explains only 27.38 percent. This work advances understanding and serves as a resource for academics.

AUTHOR CONTRIBUTIONS

Conceptualization: Nguyen Thi Dieu Chi.
Data curation: Nguyen Thi Dieu Chi.
Formal analysis: Nguyen Thi Dieu Chi.
Funding acquisition: Nguyen Thi Dieu Chi.
Investigation: Nguyen Thi Dieu Chi.
Methodology: Nguyen Thi Dieu Chi.
Project administration: Nguyen Thi Dieu Chi.
Resources: Nguyen Thi Dieu Chi.
Software: Nguyen Thi Dieu Chi.
Supervision: Nguyen Thi Dieu Chi.
Validation: Nguyen Thi Dieu Chi.
Visualization: Nguyen Thi Dieu Chi.
Writing – original draft: Nguyen Thi Dieu Chi.
Writing – reviewing & editing: Nguyen Thi Dieu Chi.

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