-RESEARCH ARTICLE-

THE NEXUS BETWEEN FINANCIAL DEVELOPMENT (FD) AND ECONOMIC GROWTH (EG) IN THE PRESENCE OF INFLATION: CASE OF VIETNAM

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─**Abstract**─

Despite the abundance of studies that have examined the correlation between financial development and economic growth, there are still gaps in our understanding. When incorporating the role of inflation into a framework, there appears to be a lack of relevant material. Furthermore, the present literature has contradictory claims, highlighting the need for research. Considering the economy of Vietnam, this article analyses the relationship between financial development and economic growth in the presence of inflation. A multilateral index for financial development is constructed using principal component analysis to achieve the purpose. Additionally, the study utilized. 1991 to 2021 has been selected as the period for this investigation. The findings indicate that financial development has a detrimental long-term influence on economic growth. However, a positive correlation is shown in the near term. The study also revealed that the threshold value of inflation is crucial for evaluating the proposed relationship. As in the case of Vietnam, it was discovered that economic growth increases due to financial development when the inflation rate is less than 9.2%, but the relationship is inverse when the inflation rate is more significant than 9.2%. The study suggests that financial intermediaries enhance and expand their credit policies to finance private-sector capital to enable the efficient allocation of capital in the private sector. The economy of Vietnam Regarding the growth of the financial market, it is required to complete the legal framework to encompass all operations, transactional developments, and supply and demand for goods.

Keywords: *Financial development, economic growth, inflation, Principal Component Analysis*

1. INTRODUCTION

A nation's economic growth is dependent on its financial industry. However, the development of the financial industry itself is contingent on the institution, instrument, and market expansion. It is argued that financial development provides a greater understanding of profitable investments and promotes optimal capital allocation. Simply put, the emergence of financial institutions helps to reduce the cost of acquiring information. In addition, it facilitates the implementation of contracts and the execution of transactions. Access to capital also increases the system's dynamic efficiency through structural changes and innovation, benefiting the entire economy (Guru et al., 2019; H. M. Nguyen et al., 2022).

Financial growth can be understood in terms of financial market size, efficiency, or stability. Moreover, increased access to financial markets has various positive effects on the economy. A well-developed financial market, for instance, transforms a nation's savings into valuable investments. It also reduces the expense of corporate governance. In addition, developed financial intermediaries support technical development via incentives (Abdul Hamid et al., 2020; Das, 2008). According to Levine (1997), monetary institutions facilitate the exchange of goods and services. In addition, it aids in trading, hedging, and risk mitigation. Levine (1997) also stated that capital accumulation and technological progress are the effective instruments that create the link between FD and EG.

However, the available literature offers divergent viewpoints regarding the link between J Robinson (1952), a member of the same school of thought, argued that money is not an antecedent of EG but is driven by it. Similarly, Buffie (1984) and Van Wijnbergen (1983) suggested that a transition from informal to the formal industry might result from financial development, which eventually reduces credit supply, hence shifting the EG level of the affected economy. In addition, Lucas Jr (1988) Lucas (1988) affirmed that financial markets play a secondary role in the economic growth of a nation. In addition, Shan (2005) argued that the Asian economic crisis of 1977 cast doubt on the notion that FD is a necessary teacher of EG. These marketplaces failed because they could not allocate massive influxes of capital to viable enterprises. In addition, the 2008 global financial crisis offered additional insight into the circumstances surrounding the collapse of the financial markets, which was precipitated by subprime mortgage lending. Therefore, the neglect and ineffectiveness of countries toward financial markets, as well as their failure to keep up with innovation, necessitates that evidence from emerging economies is added to the literature to clarify the link in question (Ali et al., 2022; Haroon et al., 2021).

As discussed, financial development and its role in a nation's economic growth have been the subject of extensive inquiry due to contradictory theoretical and practical

evidence. Schumpeter (1934)'s work inspired research on the FD and EG and their relationship. According to the report, financial systems have a crucial role in national development. Similarly, the documented report that emphasized MDGs (Millennium Development Goals) highlighted the most important policies that the financial sector is an essential sector; therefore, policies pertaining to it require proper awareness and promotion to achieve millennium development goals. Existing research indicates that financial development and its relationship with economic growth depend on inflation. Empirical evidence confirms the theoretical rationale and demonstrates that the link between the two constructs varies with the inflation rate (Bittencourt, 2011; Hadian, 2014; Kim et al., 2010). When the financial sector is strengthened, it can contribute to economic expansion. However, increased inflation reduces the financial sector's ability to mobilize resources efficiently. Due to its significance, inflation has garnered great academic interest in recent years. In addition, academics assert that inflation indirectly links financial development and economic growth. The evidence gathered from many nations also corroborated its mediation effect on the relationship mentioned above (Ehigiamusoe et al., 2019; Ehigiamusoe et al., 2021; Iyke et al., 2017). Studies have also shown that economic development is beneficial if the inflation rate is below or equal to the threshold level. However, when it crosses a particular threshold, it is detrimental to the economy. Therefore, it is essential to determine to what extent financial development promotes economic growth and to what extent this benefit diminishes with inflation.

In the context of the Vietnamese economy, the country is in the process of deeper integration with the regional and global economies. Economic integration has assisted the Vietnamese economy in achieving success. Previously, a country's economy was unstable due to a protracted war, which relegated the nation from its developing status. However, over time it has progressively repaired its economy and regained its place in the group of developing economies. From a country that often received aid from other nations, it has transformed into a global economic powerhouse. The contribution of the Vietnamese financial system to the prosperity of the Vietnamese economy is essential (Kamarudin et al., 2021; Sadiq et al., 2022). The answer to this question has extremely useful policy implications for managers and policymakers. First, if policymakers know the precise inflation threshold at which financial development boosts economic growth, they would design monetary policies to meet this objective—the current inflation rate.

Moreover, since the inflation rate is an essential factor employed to promote growth through financial development, policymakers can change the financial sector to achieve effective economic growth by reducing inflation. This study aims to investigate the influence of inflation on the link between FD and EG in the context of Vietnam based on the helpful, practical issues and contradictory statements discussed above. For managers in Viet Nam to fulfill their economic growth objectives, the study purports to

offer them credible empirical facts on which to base their financial development and inflation policies.

The study's framework is divided into five phases. The introduction section addresses the study's rationale and gaps and begins with a general discussion. The literature review section provides a synthesis of earlier work that throws insight into the link between the stated constructs to build conceptual understanding. Section 3 discusses estimation and data strategies for models. The next part is based on the data analysis and discusses the findings. The final section of the study finishes with some implications and study limitations.

2. LITERATURE REVIEW

The relationship between finance and EG has been extensively examined in economic research. Numerous researchers have attempted to study the relationship between FD and EG since the 1993 publication of Kung & Levine's essential work. However, contradictory information due to varying circumstances needs additional investigation (Sharma, 2020).

Today, financial development is a multi-dimensional development process. Through the introduction of numerous new products and services, the global financial sector has expanded substantially throughout the years (Hartani et al., 2021; Tan et al., 2022). When financial development is healthy, it will facilitate the efficient allocation of resources. This is backed by recent studies demonstrating the significance of FD in supporting the economic prosperity of nations (Lenka et al., 2020; Zeqiraj et al., 2020). In the Vietnamese context, Tran et al. (2020) collected data at the business level to determine the relationship between local financial development and firm growth that was contingent on corruption. According to the study's findings, both have a strong relationship.

Similarly, Y. N. Nguyen et al. (2019) contend that stock and bond markets contribute to the economic growth of emerging economies. The authors employed a variety of financial proxies to determine the correlation and discovered a positive relationship between the bond market and economic growth. Ang (2008) and Shibli et al. (2021) also investigated the relationship between financial development and economic growth in the Malaysian setting. The long-term effects of the study demonstrated that FD positively correlated with EG. The study by Yang (2019) also confirmed the favorable relationship between financial development and economic development in developed and less developed economies. Aside from this research, other academics contest the favorable relationship of the indicated structures. For instance, the study by Joan Robinson (1979) asserts that financial success is a consequence of economic expansion rather than input. According to Lucas Jr (1988)'s research, the crucial role of financial institutions in

national economic growth is more of a stylized truth. Based on the assumptions of information symmetry and the absence of transaction costs, Modigliani et al. (1958) concluded that the development of real sectors had no bearing on financial sectors. Even according to Morck et al. (1999)'s research, the banking industry has a detrimental effect on economic growth.

In addition, several experts have lately analyzed the endogenous financial growth and economic expansion paradigm. According to the model, the assumption is that rapid economic growth necessitates financial features in the form of products and services that facilitate access to financial markets, which are a significant driver of economic growth. Numerous studies employ the model mentioned above assumption (Jermsittiparsert, 2021; Wirsbinna et al., 2021). For example, Shahbaz et al. (2013) investigated the dynamic relationship between economic growth, financial development, energy use, and international commerce using a multivariable framework. The study's findings indicated the long-term relationship between constructs. In addition, the analysis found a bidirectional causal relationship between economic growth and financial development. Similar to Ojogiwa (2021), Pradhan et al. (2018), and Wolde-Rufael (2009), Ojogiwa (2021) and Pradhan et al. (2018) discovered a bidirectional relationship between financial development and economic growth.

There is much research that illustrates the indirect relationship between FD and growth. For instance, Alfaro et al. (2004) emphasized the significance of finance in several ways. According to the study, financial development is essential for FDI and its relationship with economic growth. In contrast, Kutan et al. (2017) investigated the relationship between finance growth and FDI and institutional quality in the context of the MENA area. Results indicate that financial development contributes significantly to economic growth in the MENA region. Moreover, Slesman et al. (2015) show that the influence of capital flows on economic growth depends on institutional quality levels. Thus, the authors assert that institutional quality is crucial for the efficient use of foreign capital flows that drive economic growth in less developed economies.

The current literature further argues that the relationship between financial development and economic growth is indirect, hence dependent on many external shocks. For example, Ehigiamusoe et al. (2021) shed light on institutions and macroeconomic stability that appear to operate as major catalysts and thereby moderate the financial-growth relationship. Indeed, many academics and researchers have acknowledged the function of inflation in managing the financial-growth nexus. It is stated that the described relationship depends on a certain inflation threshold. Huang et al. (2010) analyzed the relationship between FD and EG in 71 economies. The study's outcomes indicate that the development of financial institutions contributes to national growth. In economies with an inflation rate of less than 7.69%, a positive association between the constructs was observed, according to the data. In the case of countries where the

inflation rate was high and beyond the threshold amount, however, the relevance diminished.

Similarly, Yilmazkuday (2011) examined eighty-four nations from the cluster of developed and developing economies. The author covered the years 1965 through 2004. The study aimed to determine the threshold impact of inflation on the relationship between FD and EG. According to the study's findings, economic growth is positively affected by financial development when the inflation rate is less than ten percent. However, when inflation rates rise, the relationship becomes negative.

Similarly, Ehigiamusoe et al. (2019) examined the link between FD and EG in the presence of inflation. The study used data from 16 West African nations and covered 1980 to 2014. In the context of West Africa, the study indicated that a threshold inflation rate of 5.62 percent had a detrimental influence on financial development and economic growth. Bandura (2022) additionally investigated the moderating effect of the inflation rate on the relationship between financial development and economic growth. The sampled nations were from Sub-Saharan Africa. Results indicate that the relationship between economic growth and financial development fluctuates with the inflation rate. It has been shown that when the inflation rate exceeds 31%, the relationship between financial development and economic growth is negative. Intriguingly, countries' economies benefit from financial success when the inflation rate is below 31%. Hoomani Farahani et al. (2021) investigated further the triangular relationship between inflation, financial progress, and economic development. The authors performed their research in eight less-developed Muslim economies between 1900 and 2017. The results speculate the difference in the stated connection resulting from varying inflation rates. When the inflation rate exceeds 11.88 percent, financial development hinders economic growth.

Inflation discourages investment habits, and as a result, there is a shift toward savings. This constrains numerous economic activities and, thus, lowers economic growth. Khalilnejad et al. (2021) examined the probable inflation threshold and its influence on FD and EG. Middle East-North Africa (MENA) was chosen to investigate the link using the TAR model. The results demonstrate two inflation threshold values in Egypt, Morocco, and Iran and three inflation threshold levels in Algeria. The data imply that, unlike at low levels of inflation, at high levels of inflation, FD either harms growth rates or, in certain situations, the link becomes minor, indicating no correlation. The findings support the notion that economic growth is unaffected when economies with relatively high inflation rates undertake financial reforms.

The results are inconsistent with those of Batayneh et al. (2021) and Hoomani Farahani et al. (2021). In addition, the ARDL technique yields results indicating that inflation and FD have a negative relationship, regardless of the time. Thus, when inflation is high, it impedes the progress of a country's financial sector. Literature also indicates that

inflation looks to be an impediment that could impede the financial sector's ability to allocate resources effectively. Huybens et al. (1999) suggest that inflation has detrimental effects on the financial sector's performance and economic growth. Current models also emphasize the impact of information asymmetry in inflation and credit markets and how it affects the efficiency of financial markets in addition to EG and investment. In addition to empirical evidence, it is argued that high inflation rates hamper the efficiency of the financial system and limit long-term economic progress. In the event of a low inflation rate, however, economic growth can fluctuate and attain a greater level.

3. RESEARCH METHODOLOGY

This study aims to evaluate the relationship between FD and EG. Additionally, it attempts to determine how much volatility could occur between the association of those constructs in the current inflationary environment. Vietnam is the sampled nation, and data were collected from 1991 to 2021. The multilateral index for financial development was derived using the principal component analysis (PCA) approach. According to the economic model below, EG is a function of FD and other conditional factors. According to EG theories, these conditioning factors represent those essential determinants and offer covariation in the typical economic growth regression model. The ARDL model developed for this investigation is described below.

$$\Delta EG_t = \gamma_{10} + \sum_{i=1}^{p} \phi_{1i}\Delta EG_{t-i} + \sum_{i=0}^{q} \beta_{1i}\Delta FD_{t-i} + \sum_{i=0}^{q} \delta_{1i}\Delta OT_{t-i} + \sum_{i=0}^{q} \gamma_{1i}\Delta INF_{t-i} + \alpha_1 ECM_{t-1} \quad (1)$$

$$\Delta FD_t = \gamma_{20} + \sum_{i=1}^{p} \phi_{2i}\Delta FD_{t-i} + \sum_{i=0}^{q} \beta_{2i}\Delta EG_{t-i} + \sum_{i=0}^{q} \delta_{2i}\Delta OT_{t-i} + \sum_{i=0}^{q} \gamma_{2i}\Delta INF_{t-i} + \alpha_2 ECM_{t-1} \quad (2)$$

EG: Economic growth. FD: Financial Development. This index is calculated using the principal component analysis (PCA) method through the two most important financial development indicators. These are the Financial Institutions Index and the Financial Market Index. OT: Trade Openness is calculated as the ratio of the value of imports and exports to GDP. INF: Inflation rate

To measure the impact of the inflation threshold on the relationship between FD and EG, the regression model is built on the past few studies Herwartz & Walle (2014); Mostafa Sargolzaei et al. (2019) and Yilmazkuday (2011). The threshold is written as follows:

$$EG_t = (\alpha_{30} + \beta_{31}FD_t + \beta_{32}OT_t + \beta_{33}INF_t)_t I[INF_t > \gamma] + \varepsilon_t \quad (3)$$

4. RESEARCH FINDINGS

Evaluating the stationarity before model estimation is imperative as it helps ensure long-run association among constructs by avoiding spurious regression. The stationarity, hence, checked in the present study through Augmented Dickey-Fuller method (ADF) and Phillips-Perron method (PP) tests

Table 1. **Augmented Dickey-Fuller (ADF) and Phillips–Perron (PP) Unit Root Tests**

Variables	I(0)		I(1)	
	ADF	PP	ADF	PP
EG	0.125	0.3569	0.000^{***}	$0,0000^{***}$
FD	0.018^{**}	0.1191	0.000^{***}	$0,0000^{***}$
INF	0.000^{***}	0.000^{***}	0.000^{***}	0.000^{***}
OT	0.210	0.6976	0.000^{***}	$0,0000^{***}$

Notes: **,***significance at 5%, 1% level

The results of testing for stationarity using the ADF approach revealed the stationarity of data series at I(0) significance levels of 1% and 5%, including economic growth (EG), inflation (INF), and control variables. Nonetheless, the PP method estimation suggests that only the INF variable is steady. Therefore, for variables that do not stop at I (0), the author has taken the first difference of order I(1), and they all stop at a 1% significance level with the distinction of order I(1) for both ADF and PP testing procedures.
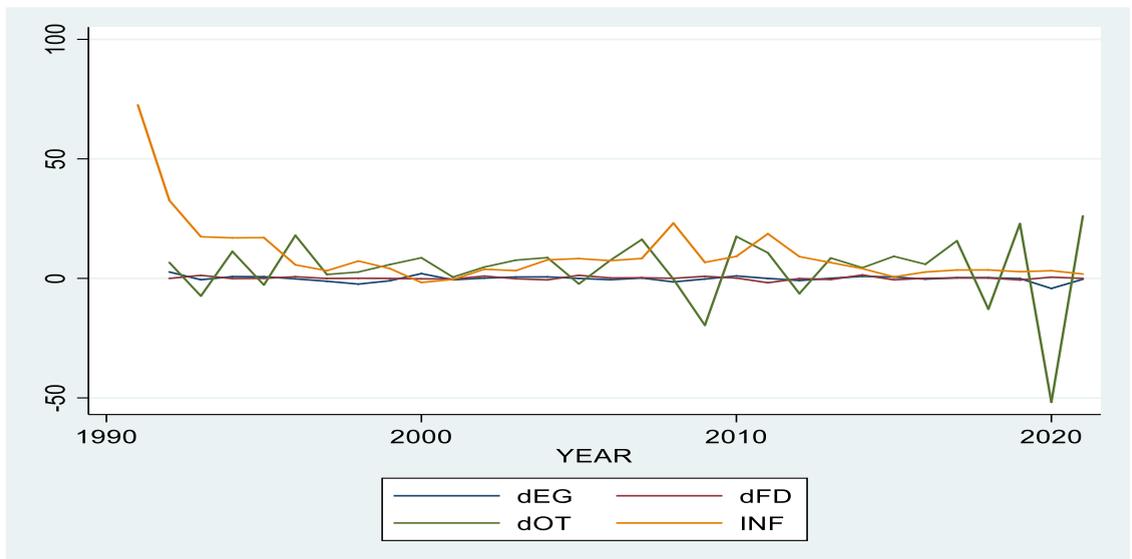

Figure 1: The Stationarity of The Research Variables
(Source: Author's analysis)

The series must be stationary to avoid misleading regression in time series data. The research variables have drifted around the predicted mean and toward the equilibrium point, as depicted in Figure 4.11. The present study's data ended at I (0) and I (1); hence, the ARDL model is appropriate for the research. According to Pesaran et al. (2001), the ARDL approach is beneficial when variables do not integrate in the same order; they may end either at I (0) or at the first difference, or both.

To examine the relationship between financial development and economic growth, a cointegration test is conducted in two models:

Model 1: F(EG)=(EG/FD, INF, OT)

Model 2: F(FD)=(FD/EG, INF, OT)

The cointegration relationship in the model was determined by calculating the statistic (F-stat) by following the suggestion of Pesaran et al. (2001) and Narayan (2005).

Table 2. **Cointegration Test Results**

ARDL		F-Statistic		Outcome	
Model 1: F(EG)=(EG/ FD, INF, OT)					
(2,3,3,2)		7.481***		Cointegration	
Critical values					
1%				5%	
Lower		Upper		Lower	Upper
4.29		5.61		3.69	4.89
Model 2: F(FD)=(FD/ EG, INF, OT)					
(1,0,0,2)		2.755		No- Cointegration	
Critical values					
1%				5%	
Lower		Upper		Lower	Upper
4.29		5.61		3.23	4.35

Notes: ***significance at 1% level
(Source: Author's analysis)

The cointegration test results in Table 2 show that:

- For model 1, the value of the F-statistic is greater than the upper bound limit value at all significance levels, so cointegration exists. Therefore, the author will analyze the relationship in the short run and the long run between the variables in model 1.

- For model 2, the F-statistic is less than the upper bound limit value at all significance levels, so there is no cointegration.

Table 3. **Estimated Long Run Coefficients using the ARDL Approach**

Variable	Coefficients	Standard Error	t-statistic	P_value
FD	-1.222405	.4360745	-2.80	0.014**
INF	.1243385	.039751	3.13	0.007 ***
OT	.0162881	.0093357	1.74	0.103
R-squared		0.8378		
Adj R-squared		0.6873		
Breusch-Godfrey LM		0.9331		
Ramsey Reset		0.6909		
Heteroskedasticity		0.7972		
Normality		0.6102		

Notes: ***, **significance at 1% and 5% level
(Source: Author's analysis)

Long-term studies indicate a negative association between financial development and economic growth at a significance level of 5%. Since the regression coefficient is -1.22 percent, there is a one percent change in financial development resulting in a 1.22 percent change in economic growth. The findings are consistent with the prevalent practices in Vietnam. The rationale is that most capital flows from Vietnam's financial system are allocated to real estate markets. Still, the problem is that real estate markets do not contribute to long-term economic growth. Thus, the study's conclusions align with the actual practices of Vietnam. To test the model's fitness, the present study incorporated several methodologies employed by earlier researchers, including Ang et al. (2007), Jalil et al. (2010), Puatwoe et al. (2017), and Tinoco-Zermeno et al. (2014). The Breusch-Godfrey LM test reveals that there is no correlation between the variables of the study. In addition, Ramsey test results validate that the proposed model does not neglect any constructs. In addition, the Heteroskedasticity test was used to identify constant variance. In addition, a normality test reveals that residuals are normally distributed. As advised by Brown (1975) the author employed the CUSUM (cumulative sum) and CUSUMSQ (cumulative sum of squares) tests to evaluate the stability of his tissues during the study period.

Figure 2 demonstrates that the CUSUM and CUSUMSQ statistics plots are adequate within critical limits, indicating that both models exhibit stability over time. The research also calculated the inflation threshold. The study's primary objective is to determine the extent to which the inflation rate influences the relationship described. Bayesian information criterion (BIC), Akaike information criterion (AIC), and Hannan-Quinn information criterion (HQC) were used to establish the cutoff score (HQIC). The threshold value of inflation was analyzed using the threshold regression method to

determine at what level of inflation financial development has a positive or negative effect on economic growth.
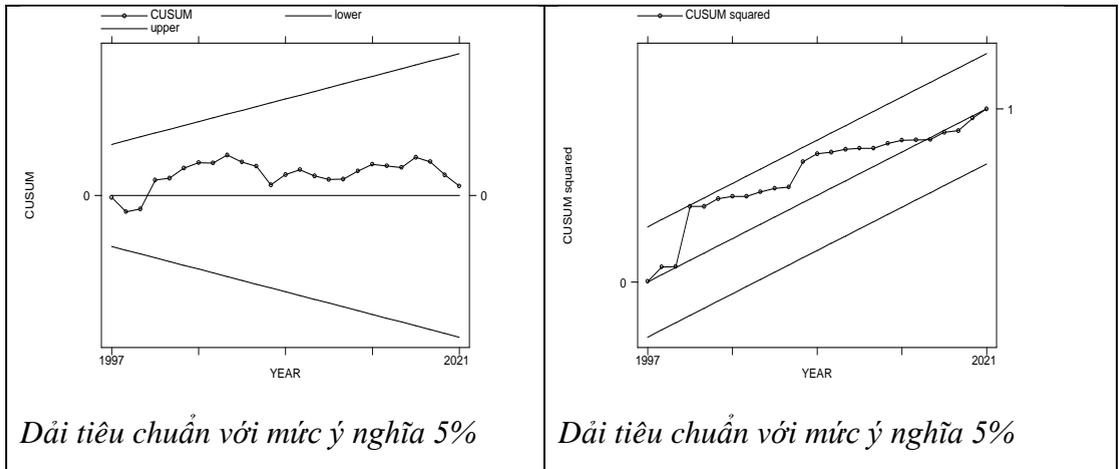

Dải tiêu chuẩn với mức ý nghĩa 5%

Dải tiêu chuẩn với mức ý nghĩa 5%

Figure 2. CUSUM and CUSUMSQ Plots for Stability Test
(Source: Author's analysis)

Table 4. Threshold Regression Results

Threshold variable INF		9.2075		
dEG	Coefficient	Std. Err.	z	P>|z|
Region1				
dDF	29.37289	14.49589	2.03	0.043**
C	-.3095919	.3391362	-0.91	0.361
Region2				
dDF	-17.61241	7.066941	-2.49	0.013**
C	.1981701	.0768768	2.58	0.010

Notes: **significance at 5% level
(Source: Author's analysis)

The analysis results indicate that financial development positively influences economic growth when the inflation rate is below the threshold of 9.2%. However, the connection becomes inverse when the inflation rate exceeds the threshold value of 9.2%. It is quite intriguing that the relationship reverses when the inflation rate exceeds a certain threshold, and it appears to be consistent with Khan et al. (2001)'s assertion that when the inflation rate of a less developed economy is less than 10 percent, the country benefits economically through consumption or investment. In addition, it provides the government with several possibilities to boost investment in less-prioritized industries through credit expansions.

5. CONCLUSION

This study re-examined the role of financial development in economic growth and the extent to which this relationship depends on the inflation rate. The study utilized data from Vietnam and covered the years 1991 through 2021. According to the study's findings, a threshold of inflation rate influences the relationship between Vietnam's financial systems and economic growth. This means a unidirectional relationship between financial development and economic growth and a 9.2% inflation threshold. When the inflation rate is below 9.2%, development positively impacts economic growth.

In contrast, when the inflation rate exceeds 9.2%, it has a detrimental effect on economic growth. This demonstrates that financial development and economic growth are interdependent in both instances and hence cannot be separated. The study suggests that financial intermediaries strengthen and expand lending policies to fund private sector capital to assist the efficient allocation of capital in the private sector. The economy of Vietnam Regarding the growth of the financial market, it is required to complete the legal framework to encompass all operations, transactional developments, and supply and demand for goods. However, the study's results cannot be generalized because the link was tested in a Vietnamese setting. Results may vary if a new country is sampled or a group of countries is researched. However, the intriguing insights inspire authors to duplicate the work in other contexts and compare the evidence to contribute substantially to the body of knowledge.

6. ACKNOWLEDGMENTS

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