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The Nexus between Banking Development and Economic Growth in the Presence of Trade Openness and Inflation: Case of Vietnam

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ABSTRACT

The purpose of this research is to examine studies on the relationship between banking development and economic growth in conditions of trade openness and inflation in Vietnam by using ARDL regression estimation method on data. time series from the first quarter of 2000 to the fourth quarter of 2019. Research results have found: There is a relationship between banking development and economic growth in terms of trade openness and inflation in Vietnam.; There was an external economic shock affecting the relationship between banking development and economic growth in Vietnam in 2008. A threshold value of 32.86% was found and a threshold value of 32.86% was found. of inflation is 9.19%. With a trade openness of less than 32.86%, it shows that banking development does not contribute to economic growth in Vietnam. However, with a trade openness greater than 32.86%, it shows that banking development has a positive impact on economic growth in Vietnam. Meanwhile, with an inflation rate below 9.19%, banking development has a positive impact on economic growth through domestic credit to the private sector. And vice versa, with an inflation rate above the threshold of 9.19%, we find a positive impact of banking development on economic growth through the interest rate spread.

INTRODUCTION

After the economic opening policy in 1986, the economic growth rate always reached over 5% per year, even in 1989 the growth rate reached 7.36%. In the period 1992-1997, Vietnam's economic growth rate was quite high, the average annual growth rate reached 8.8%, of which two consecutive years 1995 and 1997. In 1996, the economic growth rate was at 9.54% and 9.34%, respectively. However, in 1998 and 1999, the growth rate dropped sharply to 5.76% and 4.77%, then recovered and grew steadily throughout the period 2000-2007. At this stage, the average growth rate is nearly 7% per year. After joining the WTO, the economic growth rate decreased due to the influence of the world financial crisis, so the economic growth rate was only 5.66% and 5.39% in 2008 and 2009. However, after many efforts to overcome the crisis, the economy has recovered, the average annual economic growth rate in the period 2010-2018 is over 6%, of which in 2018 the economic growth rate reached 7.1%, the highest in more than ten years since the beginning of the year. since 2007 and is among the fastest growing economies in the region and the world. Compared with some countries with fast economic growth in the world in the past 32 years, the average GDP growth of Vietnam is only after China at 9.4%, and 5.9 above Korea and Malaysia. %, on Thailand is 5.2%, 2.6% in the US, 1.7% in Japan and 1.8% in Germany.

A developing economy requires a higher rate of savings and capital formation to meet the production and business capital needs of all economic sectors. Therefore, the commercial banking system plays an important role in stimulating the habit people's savings by offering various attractive deposit methods as well as expanding branches everywhere from urban to rural areas in order to exploit idle money sources in localities. The mobilization of savings in the economy is a long way in speeding up the speed of capital formation to supply businesses and individuals with investment needs in production and business through the granting of credit. Furthermore, a developing economy requires efficient resource mobilization for development purposes. The ratio of domestic credit to the private sector provided by banks to GDP has gradually increased over the years, showing that the Vietnamese banking system is increasingly meeting the increasing capital needs of the market economy. If in the first quarter of 2000, the ratio of domestic credit to the private sector provided by banks to GDP was at 27.5%, then by the end of 2010 ie the fourth quarter of 2010 it reached 114.7 percent. and by the end of 2019 reached 137.9%, in the group of countries with the highest rate. In addition, in terms of economic size, when Vietnam was embargoed by the US, the economy grew very low with a size of only 6.3 billion USD, after the lifting of the US embargo in 1995, along with the Vietnam's bilateral and multilateral cooperation with other countries has helped economic growth, the size of the economy has increased gradually. Especially, from 2002 to 2007, the scale of the economy grew strongly when the bilateral trade agreement between Vietnam and the US officially took effect. According to IMF statistics, if in 2016, the size of Vietnam's economy reached about 217 billion USD, by 2018 the size of Vietnam's economy will reach 240 billion USD, an increase of 20 billion USD compared to 2017. helped Vietnam enter the top 50 with the 49th position in the ranking of the world's top 50 economies of scale. And by the end of 2019 the growth reached 7.02%, bringing the economy size in 2019 to more than 262 billion USD, the highest ever.

The role of the financial system in economic growth has attracted the attention of scholars and policymakers. Therefore, the relationship between financial development and economic growth has always been debated by economists around the world because there are always different and even contradictory views on theory and experimentally on this relationship. The debate about the relationship between financial development and economic growth can be said to originate from the work of Schumpeter (1911) in the early 20th century. Schumpeter asserted the important role of the financial system to economic growth. In particular, he emphasized the role of banks as a decisive factor for economic growth due to the important role of the banking system in allocating capital, encouraging innovation, and financing investments that can be made. effective. The financial system is an important part of the overall economy, helping to circulate savings to entities that need capital to carry out investment projects to make the economy more efficient. The two important parts of the financial system are the financial market and the banking system.

The results of previous studies show that the role of financial development in general and the role of banks in particular has had a positive impact on economic growth such as Bonin and Watchel (2003), Johannes et al (2011), Sehrawat (2014). However, there are also many studies showing that economic growth stimulates the development of the financial system such as Awdeh (2012), Zang and Kim (2007), Liang and Teng (2006), Ang (2007), Colombage (2009), Eng and Habibullah (2011) or other scholars also find evidence for a causal relationship between financial development and economic growth as Hassan et al. (2011), Kar and Pentecost (2000). Thus, it can be seen that the results of the relationship between financial development and economic growth have mixed views in many studies.

In addition, Shangquan (2000) said that in the current global economic context, strengthening cooperation and joining trade organizations in the region and the world is an inevitable economic development trend of Vietnam and many countries in the world. Trade openness has an important influence on economic growth because it reflects the degree of international trade openness of a country and points towards the general trend of economic globalization. Expanding trade openness can have a positive or negative impact on the productivity of domestic goods producers through increasing competitive pressures, changing market shares, increasing access to advancement and diffusion of technology. The trend of economic globalization will lead to an increasing economic interdependence among countries in the world due to the increasing scale of cross-border trade and the wide and rapid spread of services and spillovers. speed of technology. Beck (2002) emphasized preferences, technology and size of the economy as resources of comparative advantage and thus determining the flow of trade between countries. Thereby, contributing to economic growth. In addition, increased trade openness could trigger demand for new financial products. Because, opening trade will face risks related to external shocks and competition from abroad. As such, financial intermediaries will evolve to offer a fuller range of products and services to serve the new needs arising from these risks (Svaleryd and Vlachos, 2002). As the financial system develops, it can create a comparative advantage for products industrial products rely heavily on external finance to stimulate economic growth.

On the other hand, international trade is also an important cause of inflation. This has started debates at various levels about the impact of trade openness and inflation to relationship financial development and economic growth. Various economies, both developed and developing, have recognized the potential for significant effects of trade openness and inflation. Many countries are adopting strategies to exploit the attributes positive effects of trade openness and inflation on economic growth. Stable control of inflation for economic growth is at the heart of macroeconomic policies in developing countries. There are many reasons to explain why inflation can affect the relationship between economic growth and finance. Intuitively, when inflation rates are high or very high, the usefulness of monetary assets will be subject to considerable volatility in future prices and interest rates. Up to the time of this study, the author has reviewed many different studies on the relationship of individual variables such as bank development, trade openness, inflation and economic growth. And found that, there are very few studies examining the relationship between banking development and economic growth in terms of trade openness and inflation, especially in countries with developing economies. The capital supply for the economy in developing countries is mainly from the important contribution of the banking system because the financial system has not developed synchronously (Naceur and Ghazouani, 2007), the market securities are nascent. In Vietnam, the operation of commercial banks has long been considered the lifeblood of the economy. Along with the development of the stock market, the capital channel through banks continues to develop and plays a key role in providing capital in the market, accounting for 70%. By the end of 2019, the outstanding credit balance to the economy was nearly VND 8.2 trillion. From the gaps in research and practice, this paper investigates the relationship between banking development and economic growth in terms of trade openness and inflation: empirical evidence in Vietnam

1. LITERATURE REVIEW

There are many empirical studies on this topic to find out the direct causes and influences of banking development and economic growth. In fact, it is argued that poor countries with a weakened financial system will be stuck in a vicious cycle in both the banking sector and the stock market, resulting in low economic efficiency that is less efficient. Low economic performance leads to low financial development. Indeed, an inadequately regulated financial system can be vulnerable to crises, with potentially devastating effects on the economy (Moshirian and Wu, 2012). In contrast, an efficient financial system, with well-developed banking and stock markets, will provide better financial services, allowing the economy to accelerate growth (King and Levine et al., 1993). In addition, financial development is not only for the development of the financial system alone but also for the poor, Demirguc-kunt and Levine (2009) in their study showed that financial development helps the poor to start catch up with the rest of the economy faster. Based on the theory of endogenous growth, Bencivenga and Smith (1991) emphasized that the development of the financial system (development of the banking industry and the stock market) is an important factor promoting economic growth. In the long term, as financial development can facilitate economic growth through multiple channels. These channels include: providing information on possible investments, for efficient capital allocation; supervise companies and exercise corporate governance; spread risks; mobilize savings; expanding the exchange of goods and services and the transfer of technology. The results of empirical research on the relationship between financial development and economic growth have been proven and classified into three groups on the direction of the relationship, which is the relationship according to the supply - leading hypothesis, the demand-following hypothesis and the feedback hypothesis relationship.

King and Levine (1993), used data from 80 countries to analyze the effect of financial sector development on economic growth GDP, with variables to measure for banking and market development. stock. After controlling for other factors affecting economic growth, a strong positive relationship was found between banking development and economic growth. Bonin and Watchel (2003) strongly agree with the view that well-functioning financial intermediation has a significant impact on economic growth. When studying the relationship between financial development and economic growth, Johannes et al (2011) used an endogenous growth model based on time series data from 1970 to 2005 in Cameroon to regression and concluded that stock market and banking development are decisive factors for sustainable economic growth. In which, control variables such as government consumption, trade openness and investment rate are basic factors in the growth equation that established a long-term positive relationship between financial development and economic growth. economic growth. Hence, it is proposed that in order to increase the positive efficiency of the financial sector, many reforms must be directed towards improving and enhancing efficiency in resource allocation, providing an accounting, legal and good institutions to develop the stock market and banking. Sehwat (2014) also examined the relationship between financial development and economic growth in India through the ARDL model using data from 1982 to 2012. The study results confirmed the relationship. long-term close relationship in financial

development, positive impact on economic growth through credit channels and private sector investment. In addition, trade openness and consumer price index also affect economic growth. Colomage (2009) provided empirical evidence on the relationship between financial development and economic growth in five industrialized economies (Canada, Japan, Switzerland, the United Kingdom and the United States) through used the VECM model to test the time series data set from 1995 to 2006, and found a unilateral causal relationship going from banking development to economic growth in Canada. The establishment of a well-developed financial system, especially a sound financial intermediary, is important for efficient credit allocation that can help maintain high and sustainable economic growth. Studying the relationship between banking sector development and economic growth in Lebanon, Awdeh (2012) used data from 1992 to 2011 and applied endogenous growth theory found a positive relationship. One-way causality from economic growth to the banking sector is the growth of deposits and credit to the private sector. In contrast, credit is provided by banks to the residential private sector, and the size and efficiency of the banking sector do not significantly affect economic growth in Lebanon. In a study by Zang and Kim (2007) examining the causal relationship between financial development and economic growth in East Asian countries on the panel dataset provided by Levine (2000). The results of the study show that there is substantial evidence that economic growth promotes development finance. Economic growth will create more demand for financial services so the financial system will grow in response to economic expansion and demand because as economic activities grow, there will be demand more for both capital and liquidity. Liang and Teng (2006) studied for the Chinese case only and found that there exists a unilateral causal relationship from economic growth to financial development in general and banking development in particular. At the same time, trade openness also has a positive impact on economic growth in China as economic growth will increase competition and efficiency in the financial markets, as the end result of economic growth will be increased. That is the economy will increase the demand for capital and financial services. In the same period as Liang and Teng (2006), a separate study for the Malaysian case using the VECM model, Ang (2007) found financial liberalization, through the removal of financial control policies. has had a favorable effect in stimulating the development of the financial sector, and at the same time, economic growth has a positive impact on financial development. Eng and Habibullah (2011), using the GMM method when testing the relationship between financial development and economic growth in countries located in Africa, Asia, Europe and the Western Hemisphere with time series data The period from 1990 to 1998 found a unilateral causal relationship from economic growth to private sector credit in the countries of the Western Hemisphere. Shan (2001), examining the relationship between financial development and economic growth in nine OECD countries and China, used a VAR model that demonstrated that economic growth helps financial development.

The supply leading hypothesis exists in the early stages of the economy, while the serial demand hypothesis will prevail in the period after economic growth. Thus, the causal direction between financial development and economic growth changes during development. Financial development can create real innovation through investment to help the economy grow (this stage occurs in a supply-led relationship). When the economy has achieved growth, then the demand for financial products and services is more, then it is the turn of economic growth to return to stimulate the development of the financial system. However, this will relate mainly to the turn-around time of industries in the economy, especially government policy. The causal relationship of financial development and economic growth can be explained from two angles. Firstly, from the perspective of the continuation demand hypothesis, as the economy develops, the economy's demand for new and different financial services increases and these needs are met rather passively. if the financial system does not develop in time corresponding to the needs of the economy. In the second view of the supply-led hypothesis, financial development first generates real growth by allocating scarce resources from small savers to large investors. In empirical research on the relationship between economic growth, banking sector development, stock market in 47 countries, Levine and Zervos (1988) found a two-way causal relationship between banks, stock market and economic growth. Hassan et al. (2011) also find a two-way causal relationship between banking development and economic growth in low-income countries such as East Asia and Latin America, where private sector credit Human factor is an important factor for economic growth and vice versa, growth helps credit to develop. Demetriades and Hussein (1996) studied the direction of the impact of financial development on economic growth in 16 countries in the period 1960-1990 and found a positive interaction of the causal relationship between financial mainstream and growth in Thailand and Korea.

Trade openness can stimulate economic growth by expanding access to large-scale high-income markets as well as low-cost access to high levels of science and technology. . However, openness to trade can also lead to greater economic vulnerability through trade shocks or financial shocks (Yanikkaya, 2003). Low level of trade openness is also sufficient for financial relations and growth in high-income countries because these countries already have most of the high-income and middle-income markets available. Financial space can help with this process. In contrast, low-income countries need a higher degree of trade openness for the growth-finance

relationship, because they can benefit from access to high levels of technology and large potential markets. capacity when expanding trade openness. The effect of trade openness on financial relations and growth seems to stem from the impact of international trade on the overall macroeconomic performance of an economy. Thus, while the trend towards trade openness can have both positive and negative effects on economic growth, it can also have an impact on the financial relationship and growth. On the one hand, openness to trade can lead to enhanced macroeconomic performance by providing low-cost access to inputs and new commodities, large markets and modern level of science and technology (Yanikkaya, 2003). At that time, the increased efficiency in all economic sectors should lead to the efficient use of capital resources allocated by the banking system. Thus, openness to trade can enhance the positive impact of financial development on economic growth. On the other hand, trade openness can weaken financial ties and growth if international trade constrains nascent domestic industries. Trade openness can also create macroeconomic instability and vulnerability to shocks occurring globally and thus can negatively impact financial relations. mainstream and growth. Therefore, the possible effect of trade openness on the financial relationship and growth remains unclear. This depends on the economy's position in international trade, where the relationship between finance and growth could tighten in economies better positioned in international trade.

The strong development of the banking system will encourage higher capital mobilization and efficient use of capital allocation for investment projects. However, when inflation occurs, there will be effects on economic growth. Inflation increases transaction costs, which inhibits economic growth. Inflation affects financial depth and also has a direct effect on growth. Inflation reduces the ability of financial intermediaries to improve resource allocation, suggesting that the effect of financial depth on growth is also attenuated when inflation is high. When inflation exceeds the threshold, finance is no longer effective for economic growth, and at the same time, the study also finds that the change in financial depth is inversely proportional to inflation in a low inflation environment and deflation will have a negative impact. positive of financial depth on growth. Inheriting and extending the work of Rousseau and Yilmazkuday (2009) through the threshold regression analysis approach found that when the inflation rate is between 4% and 19% , then the financial-growth relationship is less affected. However, beyond this threshold, growth is poor and finance is constrained. Mostafa Sargolzaei et al (2019) when studying the role of inflation in the relationship between financial development and economic growth in OPEC countries in the period from 1970 to 2015 found that when the If the inflation rate exceeds the threshold of 20.33%, the impact of financial development on economic growth in OPEC economies will decrease and even become negative.

2. METHODOLOGY

2.1 Research data

The research data of the paper was collected from the first quarter of 2000 to the fourth quarter of 2019 based on the following reliable sources:

- First, the International Financial statistics data source is on the IMF website <https://data.imf.org>.
- Second, the data source of the General Statistics Office of Vietnam (GSO) on the website <https://www.gso.gov.vn>.

2.2 Research method

The paper uses ARDL method to test the relationship between data series in the research model because the characteristics of data timeseries in Vietnam is the most suitable. Choosing ARDL with following reasons:

Firstly, the VAR model was first proposed by Princeton University professor Chrisphoper Sims in 1980 and has now become one of the most successful methods for macro-empirical analysis, especially in the field of macro-empirical analysis. monetary sector. However, the condition of VAR is that the time series must be stationary series of the same order $I(0)$, but in practice the original data series are usually non-stationary and the limitation of the VAR model is that it can only be considered. short-term relationships.

Second, the VECM model overcomes the disadvantage of VAR that is to consider the relationships both in the short and long term. However, the VECM model is only suitable for long time data series, and the data series both stop at first difference $I(1)$ and co-exist.

Third, the ARDL-ECM model overcomes the disadvantages of the VAR and VECM models that are: the data series may not stop at the same order $I(0)$ or $I(1)$, but no series stops at the same time. $I(2)$ and co-existence

sequences. At the same time, ARDL is suitable for models with small sample sizes such as time series data conditions in Vietnam.

Fourth, the ARDL model is capable of using different lags of the variables (Ozturk and Acaravci, 2011) while the Engle-Granger and Johansen method cannot apply different lags.

2.3 Research Variables

Economic growth (GROWTH)

Economic growth is an increase in the production capacity as well as the supply of goods and services in the economy. In previous studies, many measures were used to measure economic growth variables such as real GDP growth rate to measure the country's total productivity or real GDP growth per capita (Beck et al., 2000; Khan and Senhadji, 2000; Levine et al., 2000). Real GDP growth rate reflects the production capacity of the economy, so the thesis is used to represent economic growth. Real GDP has been used by many studies such as those of Kar and Agir (2011); Abu-Bader and Abu-Qarn (2008); Liang and Teng (2006); Beck and Levine (2004). The choice of real GDP has many advantages. First of all, GDP is by definition one of the most important measures to assess the activity, stability and growth of goods and services in an economy, and GDP is often viewed from two angles as GDP. nominal and real GDP. In which, real GDP considers adjustment for the impact of inflation. This means that if inflation is positive, then real GDP will be lower than nominal GDP and vice versa. If real GDP is not adjusted for inflation, then positive inflation will significantly increase nominal GDP. Thus, real GDP is a better basis for assessing the performance of the national economy in the long run than using nominal GDP.

Banking Development (BSD)

As a result of a review of the index to measure banking development that has been suggested in previous studies as an expansion of money supply (Arestis and Demetriades, 1997) and the domestic credit index (Kar and Agir, 2011). However, Khan and Senhadji (2000) argue that the expansion of money supply is not yet an indicator of banking development because it is more related to financial intermediaries providing services. is the mobilization of idle capital for lending; Meanwhile, the debt ratio does not accurately reflect the ability to provide financial services in an economy (Levine et al., 2000); The domestic credit index also includes credit extension of commercial banks, central banks and non-bank financial institutions, so the author will exclude in this study. Therefore, for this study, an appropriate selection of a bank development measure is very important to be able to provide a comprehensive picture of banking development in Vietnam and its ability to allocate capital. efficiency of banks to all sectors of the economy for investment, production and business. Currently, the nature of Vietnam's economy is a banking-based economy because banks play a key role in Vietnam's financial system. Therefore, in order to measure banking development, the thesis will measure multidimensionally according to the measurement methods of the World Bank and the IMF, which is in the direction of financial depth and financial efficiency through two indicators that are: *the domestic credit rate to the private sector provided by the bank (CRB) and the spread between the deposit and lending rates (IRS)*.

Trade Openness (OPE)

In the studies of Beck (2002); Beck and Levine (2004) trade openness is an indispensable factor when considering the relationship between economic growth and financial development. The significant contribution of trade openness to economic growth and financial development in countries has been shown by researchers such as Liang and Teng (2006) study in China, Menyah et al. (2014) study in South Africa, showing that trade openness has a very positive impact on economic growth and financial development. Trade openness has made it easier for a country to access advances in technological knowledge from its trading partners. In particular, the openness of trade in developing countries makes it easier to access investment and exchange goods for economic development (Yanikkaya, 2003). This index is calculated by taking the sum of exports and imports divided by GDP. However, excessive trade openness (to a maximum) will negatively affect the relationship between finance and economic growth in low- and low-income countries. low average. Therefore, the variable trade openness is expected by the author to have an impact on banking development and economic growth.

Inflation (INF)

In the empirical studies of Sehwat (2014) found the negative impact of inflation on economic growth when considering the relationship between banking development and economic growth. In fact, inflation not only affects growth but also affects bank performance because inflation will directly affect the amount of

deposits in banks of people and organizations in the economy. thereby affecting the capital to lend to banks. High inflation will increase the cost of capital mobilization, so it directly affects the bank's financial performance index. However, inflation does not always negatively affect the relationship between finance and growth. Mostafa Sargolzaei et al (2019) determined the inflation threshold for the relationship between finance and growth and found that finance only positively affects growth when inflation can be within a specific threshold. When inflation exceeds the threshold, finance is no longer effective for economic growth. Similarly, this variable is expected by the author to have an impact on banking development and economic growth.

2.4 Research model

The ARDL model applied in this study is as follows:

$$GROWTH_t = \alpha_{10} + \beta_{11}BSD_t + \beta_{12}OPE_t + \beta_{13}INF_t + \beta_{14}OPE_t.BSD_t + \beta_{15}INF_t.BSD_t + \varepsilon_{1t} \quad (1)$$

$$BSD_t = \alpha_{20} + \beta_{21}GROWTH_t + \beta_{22}OPE_t + \beta_{23}INF_t + \beta_{24}OPE_t.GROWTH_t + \beta_{25}INF_t.GROWTH_t + \varepsilon_{2t} \quad (2)$$

3. RESULTS AND DISCUSSION

3.1 Unit root test

Investigating cointegration by applying ARDL bounds testing is not influenced by the order of integration of variables. However, empirical studies have suggested that the existence of a second-order integrated I(2) variable can produce spurious estimations in the regression model. Therefore, to ascertain the variable order of integration, we estimated the stationary test by applying the ADF test proposed by Dickey and Fuller (1979), the P-P test proposed by Phillips and Perron (1988). The stationary test estimations are shown in Table 1

Table 1. Unit root test estimation

Biến	I(0)		I(1)	
	ADF	PP	ADF	PP
GROWTH	0,0042***	0,0094***	0,0000***	0,0000***
CRB	0,8185	0,9220	0,0000***	0,0000***
IRS	0,0020***	0,0017***	0,0000***	0,0000***
OPE	0,0840*	0,3398	0,0000***	0,0000***
INF	0,3210	0,1669	0,0000***	0,0000***
OPECRB	0,7256	0,9758	0,0000***	0,0000***
OPEIRS	0,0035***	0,0076***	0,0000***	0,0000***
OPEGROWTH	0,0011***	0,0040***	0,0000***	0,0000***
INFCRB	0,3578	0,1910	0,0000***	0,0000***
INFIRS	0,1062	0,0908*	0,0000***	0,0000***
INFGROWTH	0,2347	0,1736	0,0000***	0,0000***

Notes: ***, **, * at 1%, 5% and 10% significance levels

The results of unit root test by ADF and PP methods show that the data series is stationary at the original series I(0) with a significance level of 1% including economic growth variables (GROWTH), interest rate spread (IRS), interactive variable OPEIRRS, interaction variable OPEGROWTH . With Trade Openness (OPE) stops at series I(0) with significance level of 10% when using ADF method and PP method is not stationary. Therefore, for the variables that do not stop at I(0), the thesis has taken the first difference of order I(1) and all of them stop at the significance level of 1% with the difference of order I(1).

3.2 ARDL bounds testing

As developed by Pesaran & Shin (1998) and Pesaran et al. (2001) ARDL bounds testing Technique has been applied. ARDL bounds test was carried out with a maximum lag of 3 using Bayesian Information Criteria. The results are reported in Table 2

Table 2. Cointegration test results

ARDL	F-Statistic	Outcome
Model 1a: F(GROWTH)=(GROWTH/ CRB, OPE, INF, OPECRB, INFCRB) (1,1,2,0,2,0)	3.317	No- Cointegration
Model 1b: F(GROWTH)=(GROWTH/ IRS, OPE, INF, OPEIRS, INFIRS) (3,4,1,0,3,2)	2.011	No- Cointegration
Model 2a: F(CRB)=(CRB/ GROWTH, OPE, INF, OPEGROWTH, INFGROWTH) (1,1,1,0,4,0)	1.839	No- Cointegration
Model 2b: F(IRS)=(IRS/ GROWTH, OPE, INF, OPEGROWTH, INFGROWTH) (3,2,3,2,2,4)	9.937***	Cointegration
Critical values		
	1%	5%
Lower	Upper	Lower Upper
3.41	4.68	2.62 3.79

Notes: ***significance at 1% level

The cointegration test results in Table 2 show that:

- For model 1a, model 1b and model 2a, all F-statistics are less than the upper bound limit value at all significance levels, so there is no cointegration in these models.
- For model 2b, the F-statistic is larger than the upper-boundary limit at all significance levels, so cointegration exists in this model. The results relationship are reported in Table 3.

Table 3. Estimated Coefficients of model 2b

Variable	Coefficient	Standard Error	t-Statistic	Probability
Long run coefficients				
GROWTH	6.884837	1.869698	3.68	0.001***
OPE	1.032294	0.2887152	3.58	0.001***
INF	0.7717637	0.3384929	2.28	0.027**
OPEGROWTH	-0.1463859	0.0407042	-3.60	0.001***
INFGROWTH	-0.1021889	0.0507508	-2.01	0.049**
C	-17.41026	4.610054	-3.78	0.000
R-squared		65.39%		
Adj R-squared		51.93%		
Breusch-Godfrey LM		0.7661		
Ramsey Reset		0.2592		
Heteroskedasticity		0.8543		
Normality		0.2358		
Short run coefficients				
Δ GROWTH	-2.28352	0.5543	-4.12	0.000***
Δ GROWTH(-1)	-1.940834	0.4712634	-4.12	0.000***
Δ OPE	-0.2532239	0.0870621	-2.91	0.005***
Δ OPE(-1)	0.3422501	0.0820159	-4.17	0.000***
Δ OPE(-2)	0.0386453	0.0155662	-2.48	0.016**
Δ INF	0.5453574	0.1264457	-4.31	0.000***
Δ INF(-1)	0.1400147	0.1105885	-1.27	0.211

Δ OPEGROWTH	0.0394179	0.0121378	3.25	0.002***
Δ OPEGROWTH(-1)	0.0469506	0.0110354	4.25	0.000***
Δ INFGROWTH	0.0747369	0.0181118	4.13	0.000***
Δ INFGROWTH(-1)	0.0338453	0.0164926	2.05	0.045**
Δ INFGROWTH(-2)	-0.0072738	0.0044694	-1.63	0.109
Δ INFGROWTH(-3)	-0.0074398	0.0033243	-2.24	0.029**
ECM(-1)	-0.3780754	0.0629799	-6.00	0.000

Notes: ***, **, * at 1%, 5% and 10% significance levels

The diagnostics tests were carried out and model passed all the tests. There is no serial correlation, no heteroskedasticity (White). The functional form is correctly specified as depicted by Ramsey RESET Test. The normality test indicates that residuals are normally distributed. The Tests Results are also given in Table 3.

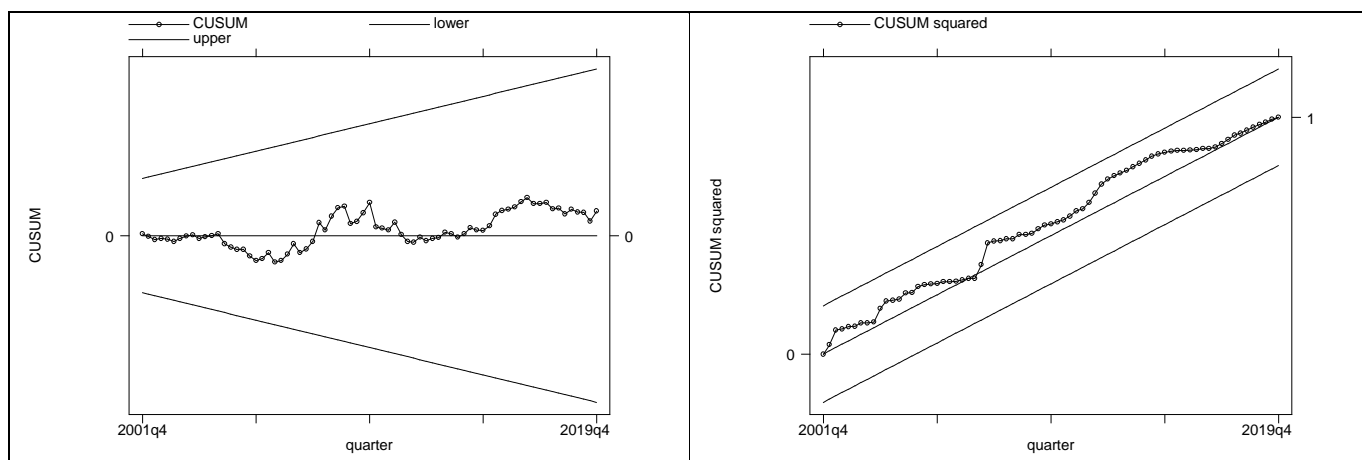
Table 3 shows that in the long run: Economic growth has a positive impact on the interest rate differential at 1% significance level, when economic growth increases by 1%, promoting banking development (efficiency) increases by 6.9%. The results of this study support the demand - following hypothesis and are consistent with previous studies by Awdeh (2012), Liang and Teng (2006), Ang (2007). The regression coefficient of long-term trade openness shows a positive effect on the interest rate differential. The results of trade openness indicate that a 1% increase will boost (effective) banking development by up to 1.03% in Vietnam. The results of this study show that the Vietnamese economy follows the classical growth theory and the endogenous growth theory, which is the trade openness that contributes to the economic growth in Vietnam through the banking system. The results of this study are consistent with previous studies by Huang and Temple (2005). Although, trade openness has positive effects on banking development (efficiency), however, the thesis will continue to study how much is the threshold value of commercial openness for banking development positive impact on economic growth in Vietnam. The regression coefficient of inflation is 0.77 at 5% significance level. This shows that inflation has a positive impact on banking development (efficiency). This result is consistent with previous research by Tan and Floros (2012). This result shows that inflation does not always cause negative effects to all sectors of the economy. However, in order to specifically determine the inflation threshold, the impact of banking development towards financial efficiency or financial depth on economic growth will be appropriate. threshold of inflation. Regression results ARDL model 2b, also found the opposite effect of two interacting variables OPEGROWTH and INFGROWTH on IRS at the significance level of 1% and 5%, respectively. A 1% increase in OPEGROWTH and INFGROWTH will decrease the IRS by 0.15% and 0.1% respectively.

The coefficient ECM(-1) has a negative sign and is statistically significant, showing that the long-run causality runs from GROWTH, OPE, INF, OPEGROWTH, INFGROWTH to GDP. The negative sign of the ECM coefficient indicates a move back to equilibrium (Granger, 1987). Furthermore, it is observed that the regression coefficients of the long-run relationship show a significant impact of all variables in model 2a on the IRS during the study period. An ECM coefficient of -0.3781 implies that, when a certain economic growth policy is implemented in terms of trade openness and inflation (i.e. short-run values increase (decrease) - If the value of bank development (effective) deviates from the long-run equilibrium curve, then in the next period (3 months later), the values of these effects will tend to return to the equilibrium position with the level of adjustment to the equilibrium position (equilibrium line in the long run) is 37.81%.

The short-run coefficients in Table 3 show the dynamic adjustment of the variables towards the long-run equilibrium. Table 3 shows that economic growth has a negative impact on the interest rate difference immediately and after 1 period. Similarly, OPE, INF, OPEGROWTH and INFGROWTH also show results in the short run that are opposite to those in the long term. Specifically, trade openness has a negative impact on the instantaneous interest rate difference, after 1 period and 2 periods, while inflation has the opposite effect on the instantaneous interest rate differential. Trade openness interacts with economic growth and inflation interacts with growth has a positive impact on the interest rate differential in the immediate and after 1 period. 1% increase in trade openness interacts with economic growth and 1% increase in inflation interacts with growth will increase the interest rate differential by 0.039%, 0.047%, 0.075% and 0.033 respectively. %. This implies that the elasticity of (efficient) banking development by trade openness interacting with economic growth and by inflation interacting with economic growth is inelastic but positive and positive. statistical significance.

3.3 CUSUM (cumulative sum) and CUSUMSQ (cumulative sum of squares) tests

The stability of long run and short run parameters was checked through CUSUM Test and CUSUMSQ Test. The parameters are stable as plot of Cumulative Sum of Recursive Residuals in Fig. 5 and Plot of Cumulative Sum of Squares of Residuals in Figure 1 are within 5% confidence interval of parameter stability. This confirms that long run and short run relationship are stable.



The straight lines represent critical bounds at 5% significance level

Figure 1. Plot of CUSUM, CUSUMSQ Test for Equation.

Next, the study will determine the threshold point of trade openness and inflation. The threshold score was determined through Bayesian information criterion (BIC), Akaike information criterion (AIC) or Hannan-Quinn information criterion (HQIC). By using the threshold regression method, the author will analyze the threshold value of trade openness and inflation to determine specifically at what level of trade openness and inflation in which banking development has a positive or negative impact on economic growth in Viet Nam.

Table 4. Result of the trade openness threshold

Threshold OPE		32.86		
GROWTH	Coef	Std. Err.	t-Statistic	Probability
Region 1				
dCRB	0.0345263	0.0436155	-0.79	0.429
IRS	0.1963727	0.1527296	1.29	0.199
C	5.911683	0.6086843	9.71	0.000
Region 2				
dCRB	0.0697404	0.02229	3.13	0.002***
IRS	0.5605203	0.1965622	2.85	0.004***
C	5.052212	0.5731792	8.81	0.000

Notes: ***significance at 1% level

The results in Table 4 show that the threshold value of trade openness is determined to be 32.86%. This is the value that divides the two regions before and after the threshold where the impact of banking development on economic growth is positive or negative. With a trade opening of less than 32.86%, it shows that banking development is not statistically significant. This shows that, with a trade openness of less than 32.86%, domestic credit from the private sector provided by banks and interest rate differentials do not contribute to economic growth in Vietnam. However, with the area above the threshold of 32.86%, it shows that CRB and IRS have a positive impact on GROWTH or in other words, when the commercial openness is greater than 32.86%, banking development has a positive impact on GROWTH. economic growth in Vietnam. This is consistent with the research of lyke et al (2016), Huang and Temple (2005).

Table 5. Result of the inflation threshold

Threshold INF	9.19			
GROWTH	Coef	Std. Err.	t-Statistic	Probability
Region 1				
dCRB	0.0868454	0.0260892	3.33	0.001***
IRS	0.1441337	0.1153604	1.25	0.212
C	6.216487	0.376532	16.51	0.000
Region 2				
dCRB	0.0219538	0.0288704	-0.76	0.447
IRS	1.224716	0.2932326	4.18	0.000***
C	2.594127	0.9682877	2.68	0.007

Notes: ***significance at 1% level

The results in Table 5 show that, with an inflation rate below the threshold of 9.19%, only domestic credit in the private sector has a positive impact on economic growth at the 1% significant level, while the difference in margin is limited. interest rate difference is not statistically significant, so it does not affect economic growth. This shows that banking development has a positive impact on economic growth through domestic credit to the private sector when the inflation rate is below 9.19%. And vice versa, with an inflation rate above the threshold of 9.19%, we find a positive impact on economic growth through the interest rate differential at 1% significance level, while domestic credit for the private sector is not statistically significant, so it has no impact on economic growth. This means that when the inflation rate is above 9.19%, banking development has a positive impact on economic growth through the interest rate differential. Thus, when inflation is high, interest rates are an effective management tool in the economy.

CONCLUSION

Research results show that banking development is affected by economic growth, trade openness and inflation. Therefore, in order for the bank to promote and take advantage of the economic growth and the expansion of trade openness. The Vietnamese government needs to focus on perfecting credit policies to facilitate the private sector in the manufacturing sector to access loans. Because the growth rate of the private sector is always maintained, accounting for about 50% of GDP, attracting about 85% of the labor force of the economy, making an important contribution to creating jobs, increasing income income of the people and in mobilizing social resources for investment and development of production and business. Therefore, developing the private economic sector is also creating conditions to free up development resources in society. Thus, when the bank perfects and expands its credit policy to finance capital for the private sector, it will both help the bank achieve its business goals and facilitate the efficient allocation of capital in the economy. economic. On the other hand, continuing to promote cooperation and expand trade with countries, especially key markets, and especially, it is necessary to have policies to attract multinational economic groups to invest in Vietnam. Vietnam in the fields of export production has potential. The research results show that the interest rate differential is affected by economic growth, trade openness and inflation. This shows that the interest rate management tool is very important for the Vietnamese economy. The interest rate policy must ensure that it does not cause market shocks, ensure stability, and fulfill the objectives of controlling inflation and economic growth. Operating monetary policy flexibly but cautiously, closely combined with macroeconomic policies in order to stabilize the macro-economy, contribute to stable economic growth and ensure the safety of commercial banks' operations. commercial.

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