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FINANCIAL DEPTH AND THE REAL ESTATE MARKET: AN EMPIRICAL STUDY OF THE WEALTH EFFECT

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Toan Ngoc Bui

Faculty of Finance and Banking, Industrial University of Ho Chi Minh City (IUH), Vietnam.
Email: buingoctoan@iuh.edu.vn

ABSTRACT

The study uses the wealth effect to investigate the impact of financial depth on the real estate market. More specifically, financial depth is used to measure the size of the banking system and stock market in relation to the economy. As data were collected in Vietnam—an emerging country with a limited financial depth and an emerging real estate market—the study is expected to reveal many notable findings. The author employs the Autoregressive Distributed Lag (ARDL) approach, which generates reliable results, even with the data observation restrictions that are a typical feature of data analysis in emerging countries. The results show that the effect of financial depth, which is observed from the perspective of the banking sector and the real estate market, can be clearly demonstrated through the wealth effect and its significance in the short- and long-term. On the other hand, the significant impact of financial depth on the real estate market from the perspective of the stock market has not yet be found. The findings reveal a significant difference in the wealth effect between Vietnam and other developed countries. This is the first study to present empirical evidence for the impact of financial depth on the real estate market in an emerging country using the wealth effect. Therefore, the results of this study are essential, not only for Vietnam, but for all emerging countries.

Contribution/Originality: This study is one of the very few studies that have used the wealth effect to investigate the impact of financial depth on the real estate market. The findings reveal a significant difference between the wealth effect of Vietnam and other developed countries.

1. INTRODUCTION

The impact of financial depth on the real estate market can be demonstrated through the wealth effect, which was first introduced in the studies of Friedman (1957) and Ando and Modigliani (1963). Recently, more researchers, such as Bunda and Ca'Zorzi (2010), Shen, Lee, Wu, and Guo (2016), Choi and Park (2017), and Lim (2018) have been discussing the wealth effect. Improvements in financial depth enable households and firms to increase their assets, which stimulates consumption and investment. Real estate refers to both consumer goods and investment (Kapopoulos & Siokis, 2005). Financial depth can cause an increase in real estate prices, as well as the appearance of real estate bubbles (Lim, 2018). The majority of previous studies have stated that financial depth can boost the real estate market. However, if surplus uncontrolled capital enters the real estate market, it can cause bubbles in the real estate market, as well as increasing the risk of crises and dramatic crashes. In fact, the global financial crisis of 2007

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is a typical example. The significant influence of financial depth on the real estate market is undeniable. Nevertheless, contradictory views on the extent of this impact still exist. Moreover, the majority of studies that have considered the effect of financial depth on the real estate market have lacked empirical data that examine the wealth effect. Furthermore, this impact has mainly been investigated in developed countries, as opposed to emerging countries with limited financial depth and a fledgling real estate market like Vietnam. Therefore, an examination of the impact of financial depth on the real estate market in Vietnam using the wealth effect is expected to reveal unprecedented findings that will answer the following question: "Does the impact of financial depth on the real estate market relate to the wealth effect?".

The remaining part of the paper consists of the following sections: A literature review and hypothesis development; research methodology; data analysis and a discussion of the findings; and a conclusion.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

The wealth effect theory is frequently mentioned in empirical studies on the real estate market and is particularly appropriate when analyzing the impact of financial depth on the real estate market. Although the wealth effect was first introduced in studies by Friedman (1957) and Ando and Modigliani (1963), it has recently received increased attention in empirical research on the real estate market, especially in developed countries (Nguyen, Xuan, & Bui, 2020).

According to the wealth effect, consumption is the function of disposable income and total assets. Indeed, income and total assets both have a positive influence on consumer spending (Bui, 2020a). Total assets can be defined as the sum of one's financial assets (stocks, bonds), real estate, and other assets. Real estate is considered to be both a consumption good and an investment good (Kapopoulos & Siokis, 2005). Admittedly, the wealth of a household or firm determines how they consume and invest; an increased financial depth raises the value of one's assets and income from investments, which makes the household or firm feel richer and consume more. Furthermore, their housing demand and real estate investment increases, which leads to developments in the real estate market. Thanks to the effects of portfolio adjustments, the link between financial depth and the real estate market could be stronger. This is because, when the value of their financial assets increases, investors tend to transfer their investment from the stock market or banking sector to other asset markets, such as the real estate market, in order to rebalance their portfolio (Kapopoulos & Siokis, 2005; Markowitz, 1952).

On the other hand, a decrease in financial depth leads to a decrease in the value of a household or firm's financial assets, as well as their wealth. In order to ensure long-term living security and balance their account, there is a tendency for households or firms to reduce their consumption and investments, which causes a considerable decline in the real estate market. Therefore, it can be said that financial depth significantly affects the real estate market through the wealth effect.

In the real estate market, relocating, leasing, consulting, and broking are carried out (Thu & Perera, 2011). Therefore, the real estate market can be measured through the growth of business activities, which mainly consist of relocations, leasing houses or offices, consulting, and broking (Bui., 2019; Lambertini, Mendicino, & Punzi, 2017; Nguyen, Bui, & Nguyen, 2019; Nguyen & Bui, 2019; Ni & Liu, 2011). Financial depth is an essential part of financial development (Bui, 2020b) as it demonstrates the size of the financial sector in relation to the economy (Bouchouicha & Ftiti, 2012; Klein & Olivei, 2008). Financial depth also reflects the ability of the financial sector to supply capital to the economy (Bui, 2019), and more specifically, to the real estate market (Nguyen et al., 2020). The measurement of financial depth is generally estimated using domestic credit in the private sector and stock market capitalization (Choi & Park, 2017; Fisman & Love, 2003; Shen, 2013), which is what the author has used in order to develop the hypotheses.

The impact of domestic credit to private sector (DC) on the real estate market (RE): DC is an indicator of financial depth from the perspective of the banking sector, or more specifically, the size of the banking system in relation to

the economy. A high DC value is a sign of improved financial depth, and vice versa. DC can also refer to the amount of domestic credit that banks supply to the private sector, including households and other financial institutions, in order to meet their investment and consumption demands, thereby boosting the real estate market. The positive effect of DC on the RE through the wealth effect has been reported in some empirical research, such as studies by Bunda and Ca'Zorzi (2010), Shen et al. (2016), Choi and Park (2017), and Lim (2018). Therefore, in this study, the effect is expected to be positive and in accordance with the wealth effect.

Hypothesis H₁: Domestic credit to private sector (DC) positively affects the real estate market (RE).

The impact of stock market capitalization (MC) on the real estate market (RE): MC is a proxy of financial depth from the perspective of the stock market, or more specifically, the size of the stock market in relation to the economy. A high MC value implies a good financial depth, and vice versa. An increase in MC leads to an increase in capital from the stock market entering the real estate market, which boosts the real estate market. The positive link between MC and the RE through the wealth effect was analyzed by Choi and Park (2017) through an examination of data from 23 countries. The study concluded that, the stronger the stock market, the more the banks will contribute to developments in the real estate market. Thus, in this study, the impact of MC on the RE is expected to be positive, which demonstrates the relevance of the wealth effect.

Hypothesis H₂: Stock market capitalization (MC) positively affects the real estate market (RE).

3. RESEARCH METHODOLOGY

To examine the impact of financial depth on the real estate market through the wealth effect, the author employed the ARDL approach suggested by Pesaran, Shin, and Smith (2001). This approach has many advantages and is suitable in cases of limited data, which is a feature of emerging countries. The ARDL approach is also suitable for a short time series (Pahlavani, Wilson, & Worthington, 2005), especially non-stationary ones (Tursoy & Faisal, 2016).

Following the suggested hypotheses, the research model employs the following equation:

$$\Delta RE_t = \alpha_0 + \sum_{j=1}^{k} \lambda_1 \Delta RE_{t-j} + \sum_{j=0}^{k} \lambda_2 \Delta DC_{t-j} + \sum_{j=0}^{k} \lambda_3 \Delta MC_{t-j} + \sum_{j=0}^{k} \lambda_4 \Delta CV_{t-j} + \beta_1 RE_{t-1} + \beta_2 DC_{t-1} + \beta_3 MC_{t-1} + \beta_4 CV_{t-1} + \varepsilon_t \qquad (1)$$

Or:

$$\Delta RE_t = \alpha_0 + \sum_{j=1}^{k} \lambda_1 \Delta RE_{t-j} + \sum_{j=0}^{k} \lambda_2 \Delta DC_{t-j} + \sum_{j=0}^{k} \lambda_3 \Delta MC_{t-j} + \sum_{j=0}^{k} \lambda_4 \Delta CV_{t-j} + \phi\, ECM_{t-1} + \varepsilon_t \qquad (2)$$

Where k is the lag length; α_0 is constant; λ_1, λ_2, λ_3, λ_4 are short-term multipliers; β_1, β_2, β_3, β_4 are long-term multipliers of lagged variables in the model; ϕ is the speed of adjustment; and ECM is the error correction term lagged by one time period.

3.1. Dependent Variable

The RE is estimated using the growth index of the real estate market. RE shows the quarterly growth (compared to the same period last year) of real estate business activities, which include relocations, the leasing of houses or offices, consulting, and broking. This dependent variable has been employed in studies by Ni and Liu (2011), Lambertini et al. (2017), Bui (2019), Nguyen and Bui (2019) and Nguyen et al. (2020).

3.2. Independent Variables

As proxies of financial depth, the two independent variables are DC and MC. They indicate the size of the banking system and the stock market relative to the economy, as well as being important indices in the financial development index database of the International Monetary Fund (IMF).

DC: Following what has been accomplished by Bunda and Ca'Zorzi (2010), Shen et al. (2016), Choi and Park (2017), and Lim (2018), DC is measured by domestic credit to private sector (% of GDP), which is a proxy of financial depth from the perspective of the banking sector. This variable is estimated quarterly and is compared to the quarterly data from the previous year.

MC: Following measurements suggested by Choi and Park (2017), MC is estimated using the stock market capitalization-to-GDP ratio, which is an indicator of financial depth from the perspective of the stock market. MC is measured by quarterly growth and is compared to data from the same period in the previous year.

3.3. Control Variables

In this study, the author includes control variables (CV) to indicate the domestic and global macroeconomy. In addition to financial depth, the real estate market can also be influenced by economic growth (EG) and global financial crises (FC).

EG: This variable represents the domestic macroeconomy by reflecting actual developments of the domestic economy that may influence asset value (Bouchouicha & Ftiti, 2012). A healthy economic growth will stimulate consumption and investment demands, thus boosting the RE (Igan, Kabundi, De Simone, Pinheiro, & Tamirisa, 2011; Nyakabawo, Miller, Balcilar, Das, & Gupta, 2015; Tupenaite, Kanapeckiene, & Naimaviciene, 2017; Zhang, Li, Hui, & Li, 2016; Zhao, Zhan, Jiang, & Pan, 2017). However, an excessive increase in EG can cause real estate bubbles, a greater risk of crisis, and a significant decline in the RE (Chang, Chen, & Leung, 2012).

FC: FC plays a crucial role in the RE of each country, as reported by Huang, Leung, and Qu (2015). However, very few empirical studies have considered the link between FC and the RE and how FC may put the RE at a greater risk (Golob, Bastic, & Psunder, 2012). As the risk of crisis in the RE is a significant concern for policymakers in developing countries (Zhang et al., 2016), FC have been added to the model in order to reveal the correlation between shocks to the global macroeconomy and the RE in Vietnam. This is expected to reveal unprecedented findings. Following what has been carried out by Cayon, Thorp, and Wu (2018) and Kapan and Minoiu (2018), the FC has been measured using a dummy variable that is equal to 1 during the global financial crisis (from Q3 2007 to Q1 2013) and 0 for the remaining periods.

Vietnam's real estate market was officially established by the issuance of the 2003 Land Law, which has been implemented since July 1st, 2004. As a result, data were collected in Vietnam between the third quarter of 2004 and the last quarter of 2018. Date concerning RE and EG were obtained from the General Statistics Office of Vietnam (GSO), and data concerning DC and MC were obtained from the IMF and the State Securities Commission of Vietnam (SSC), respectively.

4. DATA ANALYSIS AND DISCUSSION OF THE FINDINGS

The quarterly data from Q3 2004 to Q4 2018 and the variables are shown in Table 1.

Table 1. Descriptive statistics

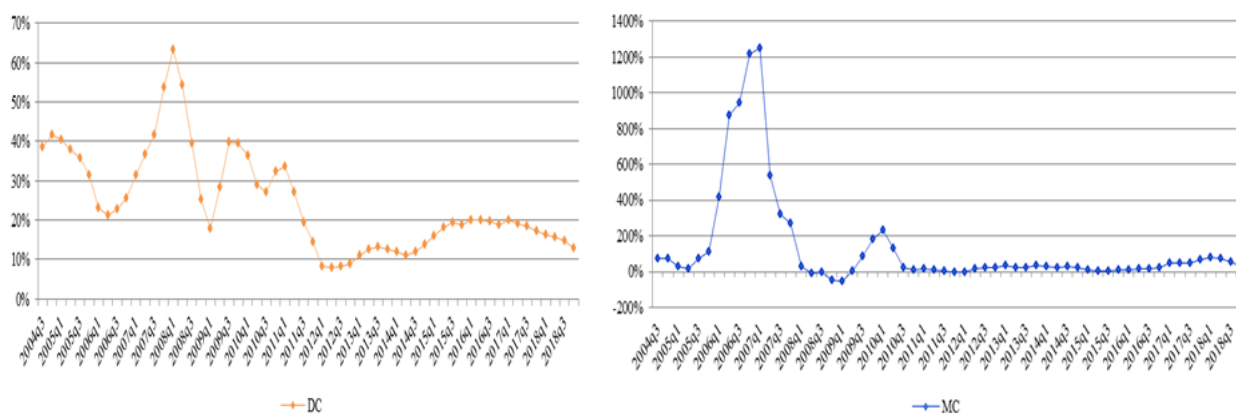| Variable	Mean	Min	Max
RE	0.029	–0.013	0.059
DC	0.246	0.080	0.632
MC	1.316	–0.530	12.503
EG	0.066	0.031	0.095
FC	0.397	0	1

Figure 1. Developments of domestic credit to private sector and stock market capitalization in Vietnam.
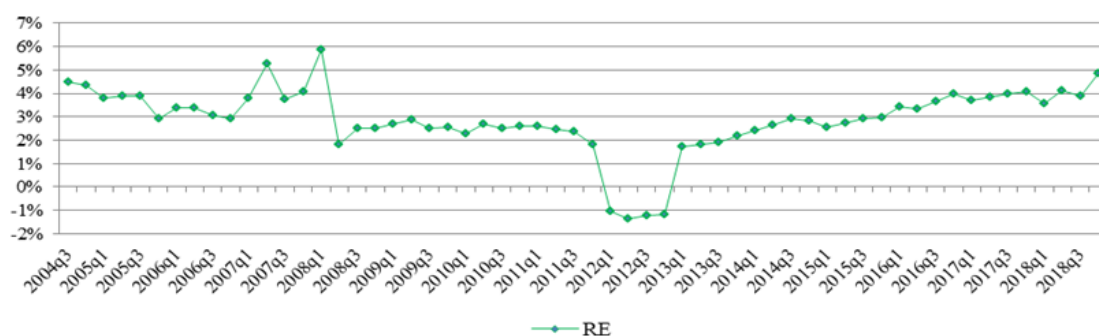**Source:** Author's calculations based on IMF and SSC data.

Figure 2. Developments of the real estate market in Vietnam.
Source: Author's calculations based on GSO data.

Being an emerging country with limited financial depth, Vietnam's banking sector plays a key role in supplying capital to the economy. The emerging stock market is small in size, compared to the rest of the economy. Despite its size, it experienced an impressive growth before the global financial crisis, as shown in Figure 1. During this period, capital from the banking sector and stock market into the real estate market also increased, as seen in Figure 2. However, the real estate market started to fall considerably in Q2 2008, due to the negative impact of the global financial crisis. In particular, there were difficulties accessing capital from aforementioned sources. The decline in the real estate market endured during the global financial crisis. Recently, financial depth has improved significantly, which greatly contributes to the recovery of the real estate market.

Table 2. Dickey-Fuller test results

Variable	At level	At Δ
	I(0)	I(1)
RE	0.117	0.000***
DC	0.471	0.002***
MC	0.364	0.000***
EG	0.045**	0.000***
FC	0.562	0.000***

Note: ** and *** indicate significance at the 5% and 1% level, respectively.

The Dickey-Fuller test, proposed by Dickey and Fuller (1979), shows that EG is stationary at the root time series I(0) at a 5% level of significance, whereas the other variables become stationary after the first difference I(1) at a 1% significant level (Table 2).

Table 3. Bound test results

p-value	I(0)	I(1)
	0.012**	0.063*

Note: * and ** indicate significance at the 10% and 5% level, respectively.

The Bound test developed Pesaran et al. (2001) reports that cointegration exists among the data series at the 10% significant level (Table 3). Thus, the ARDL approach is valid for both long-term and short-term estimations.

Table 4. Model estimation testing results

Variable	Coef.	P>|z|
Long run results		
DC	0.064***	0.007
MC	–0.001	0.814
EG	0.099	0.696
FC	–0.020***	0.001
Short run results		
△DC	0.034**	0.029
△MC	–0.001	0.816
△EG	0.048	0.698
△FC	–0.011***	0.004
ECM(-1)	–0.530***	0.000
Constant	0.008	0.259
R-squared	28.76%	
Significance level	Prob>F = 0.003***	
White's test	Prob>chi2 = 0.436	
Breusch-Godfrey LM test	Prob>chi2 = 0.875	
Ramsey Reset test	Prob>F = 0.494	

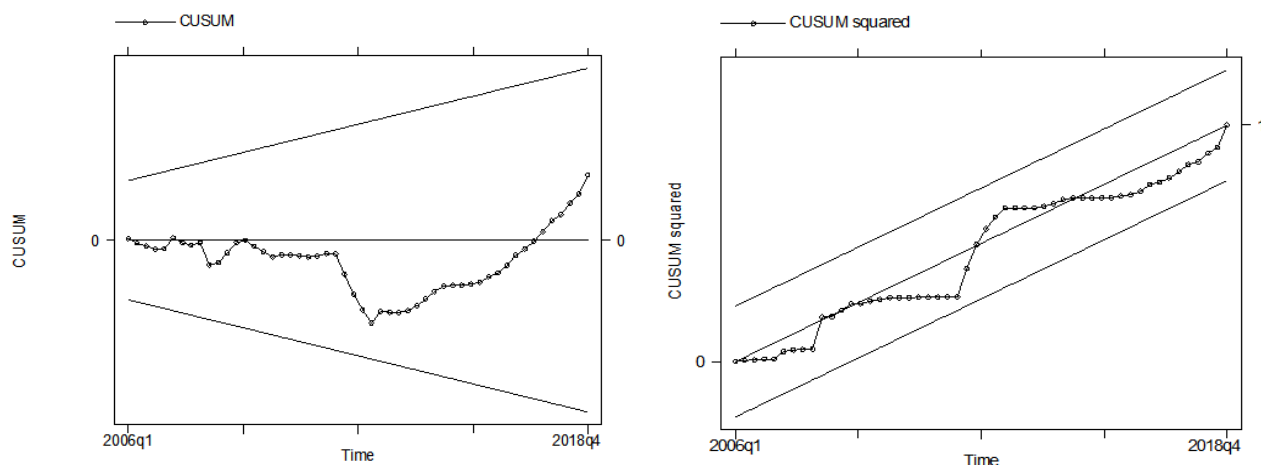**Note:** ** and *** indicate significance at the 5% and 1% level, respectively.

Figure 3. Stability tests

Source: Author's calculations.

As seen in Table 4, the results of the model estimation are valid and significant at the 1% level. Furthermore, results of the White's test and Breusch-Godfrey LM test demonstrate that issues of heteroscedasticity and autocorrelation do not exist in the model. With regard to stability, the stability tests show that both CUSUM and CUSUM square test are within the standard boundary of a 5% significant level (Figure 3). Therefore, it can be deduced from the results of the model estimations that the ARDL approach is valid and utilizable.
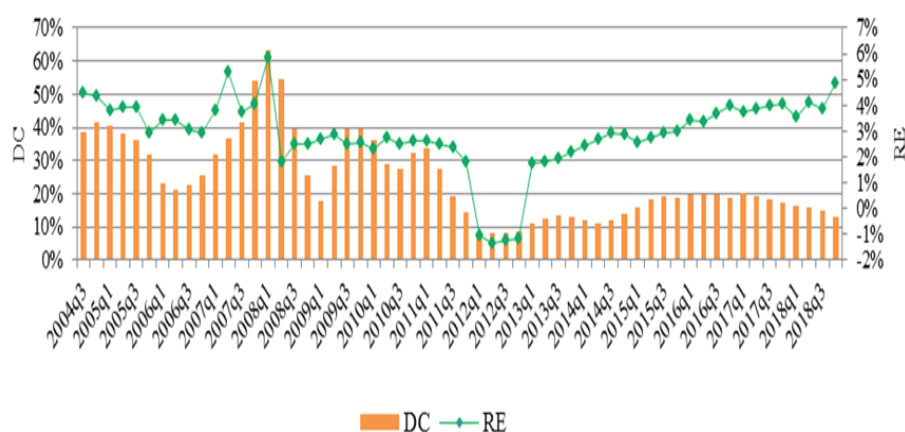
Figure 4. Developments of domestic credit to private sector and the real estate market in Vietnam
Source: Author's calculations based on IMF and GSO data.

Hence, RE is positively affected by DC in the short-term (λ = 0.034 at a 5% significant level) and long-term (β = 0.064 at a 1% significant level). In other words, financial depth from the perspective of the banking sector is essential in promoting Vietnam's real estate market. This means that improvements in DC (households and non-bank financial institutions) give rise to real estate consumption and investment demands, which develops the real estate market. It can be seen that the wealth effect is an appropriate measurement to use when explaining the impact of financial depth on the real estate market in Vietnam, from the banking sector's perspective. This is in line with findings by Bunda and Ca'Zorzi (2010), Shen et al. (2016), Choi and Park (2017), Lim (2018), although this study is one of the first to have focused on an emerging country like Vietnam. Vietnam's banking system plays an important role in supplying credit to the economy as well as the real estate market. In 2007 and early 2008, the increase in DC led to a significant growth in the real estate market. Then, in 2011 and early 2012, as a result of the weak economy, strict credit policies, and difficulties accessing capital, there was a steep decline in the real estate market (Figure 4). Recently, owing to the recovery of the global and domestic economy, the credit supplied by the banking sector has improved significantly, which has substantially contributed to the recovery of the real estate market. Therefore, it can be concluded that DC supports the real estate market through the wealth effect. On the other hand, if banks issue excessive lending or increase loans for high-risk projects, it could result in real estate bubbles or even crises and considerable market declines; the 2007 global financial crisis is an example of this. Therefore, it is necessary for the banking sector to build a sustainable credit policy.

This study, however, does not reveal the significant correlation between MC and RE, which is logical given the new, relatively small, stock market in Vietnam. The stock market cannot exert considerable influence on the real estate market in the short- or long-term, which differentiates Vietnam from other developed economies where financial depth from the perspective of the stock market significantly affects the real estate market, perhaps even more than financial depth from the perspective of the banking system (Choi & Park, 2017). This study, however, reports a totally different result.

In addition, the results reveal the fact that the relationship between FC and RE is negative and significant at the 1% level in the short- and long-term. It can be deduced that, in addition to financial depth from the perspective of the banking sector, the real estate market is also negatively affected by shocks caused by the global financial crisis. Thus, through integration in the global economy, the positive impact of the global financial crisis on Vietnam's real estate market is inevitable.

5. CONCLUSION

With the objective of considering the impact of financial depth on the real estate market through the wealth effect, the author employed the ARDL approach. More specifically, financial depth was measured in reference to the

size of the banking sector and stock market in relation to the economy. Through this study, the author has greatly succeeded in presenting empirical evidence on the impact of financial depth on the real estate market in Vietnam through the wealth effect, from the perspective of the banking sector. However, it has been found that financial depth from the perspective of the stock market does not have a significant impact on the real estate market. The study reveals an unprecedented finding that declares the discrepancy in wealth effect between Vietnam and other developed economies. Furthermore, the findings have shown the negative impact of the global financial crisis on the real estate market in both the short- and long-term.

These results are essential for Vietnam and other emerging economies. Based on these findings, a number of suggestions to improve financial depth and build a sustainable real estate market in Vietnam have been produced:

- Banks should aim for sustainable development, in terms of offering stable credit supplies to the real estate market. It is also necessary for them to control excessive lending (particularly for high-risk projects), thereby reducing the risk of real estate bubbles.

- Banks should implement a warning system for credit risks and pay more attention to the prevention of credit risks, specifically real estate credit. This system should continue to evaluate the risk level of each client. Banks should be more active in risk prevention through the supervision and management of credit risks.

- Although financial depth from the perspective of the stock market is not significantly correlated to Vietnam's real estate market, it is vital that the stock market is boosted to stimulate the real estate market, as a healthy stock market is an efficient channel that provides medium- and long-term capital to the real estate market.

Despite achieving its objectives, the study still has limitations. First, it considered financial depth from the perspectives of the banking sector and the stock market, which are only two of the essential indicators of financial development. Owing to limitations in the data collection, the author could not examine other factors that may indicate financial development, such as access to finance, financial efficiency, and financial stability. These perspectives may be valid proposals for future investigations.

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