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CREDIT AND HOUSING MARKETS IN VIETNAM: EVIDENCE FROM VECM ANALYSIS

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ABSTRACT

This study focuses on examining the role of the credit market in the housing market in the two largest cities of Vietnam, a developing country with limited empirical research on this issue. In specific, the credit market is defined by credit growth, while the housing market is measured by the house price index. The dataset is collected quarterly from Q1 2009 to Q4 2022. By employing the Vector Error Correction Model (VECM) method, the findings reveal that bank credit has a positive impact on housing prices in the long term, a result observed in both of Vietnam's largest cities - Ho Chi Minh City and Hanoi City. Moreover, economic growth and the consumer price index also significantly influence housing prices in Vietnam. Based on these findings, the author suggests implications for promoting the credit market coupled with the development of the housing market. Furthermore, the findings offer practical and meaningful insights not only for Vietnam's cities but also for other developing countries worldwide.

Keywords: credit growth, credit market, domestic credit, housing market, housing prices, VECM, Vietnam

JEL Classification: E51, E64, R31

INTRODUCTION

The credit and housing markets have garnered significant attention from researchers and policymakers across many countries (Ibrahim & Law, 2014), as these two markets are closely related. In fact, their relationship during boom-bust cycles can exert a considerable impact on the economy (Guerrieri & Uhlig, 2016), with the global financial crisis of 2007-2008 serving as a typical example of this issue (Ibrahim & Law, 2014; Nguyen & Bui, 2021). Moreover, some argue that the credit and housing markets provide valuable information for policymakers in formulating appropriate policies to stabilize the economy (Goodhart & Hofmann, 2008). It is evident that there might be a mutual relationship between the housing and credit markets. Specifically, a developing and expanding credit market can increase demand for housing, thereby driving up housing prices (Oikarinen, 2009). Conversely, a growing housing market can also lead to increased demand for credit, thus the credit market (Goodhart & Hofmann, 2008). In developing countries like Vietnam, where the housing market is still relatively nascent, capital from the credit market continues to play a key role in the housing market. Given this context, the impact of the credit market on the housing market has become a big concern for these countries. By clarifying this impact, developing countries such as Vietnam would have a reliable foundation for identifying appropriate solutions to promote the credit market in line with the long-term development of the housing market. Given this meaning, the study focuses on analyzing the impact of the credit market on the housing market in Vietnam.

In the existing literature, the impact of the credit market on the housing market has been examined in most of the research. Theoretically, this impact is demonstrated through the credit effect and the consumption function theory (Friedman, 1957). Accordingly, increased access to credit can encourage households and companies to borrow more, which stimulates consumption and investment in the economy, creating favourable conditions for wealth accumulation. As a result, the demand for housing rises, leading to an increase in housing prices. A large number of empirical studies have found a positive effect of the credit market on the housing market, primarily in developed

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countries with well-established housing markets. These include countries such as the United States (Hott, 2011; Lambertini et al., 2017), the United Kingdom (Hott, 2011), Spain (Gimeno & Martínez-Carrascal, 2010), and China (Che et al., 2011; Chen et al., 2022; Huang et al., 2015; Jiang et al., 2018; Xu & Chen, 2012; Zhang & Huang, 2024). It is evident that the positive impact of the credit market on the housing market is a trend frequently observed in empirical research. However, some perspectives suggest that excessive growth in bank credit could negatively affect the housing market (Bhatt & Kishor, 2022). This indicates that differing viewpoints still exist regarding the impact of the credit market on the housing market.

Although the impact of the credit market on the housing market has been a topic extensively addressed in a large number of empirical studies, most of them have been conducted in developed countries (Ibrahim & Law, 2014), with only a few examining this issue in developing countries such as Vietnam. One of the reasons is that the housing markets in these countries are still relatively young, and more importantly, the data are very limited. This has created certain challenges for research aiming to investigate this subject quantitatively and over a sufficiently long period. The lack of empirical evidence in developing countries also poses difficulties for policymakers in these nations in determining appropriate solutions to promote credit market development in conjunction with the long-term growth of the housing market.

To address the gap, this study is conducted to analyze the impact of the credit market on the housing market in Vietnam. This research aims to provide policymakers with a more comprehensive understanding of the effect of the credit market on the housing market in Vietnam. Additionally, the results will contribute valuable empirical evidence to the existing literature, particularly in the context of a developing country with a relatively nascent housing market.

In this study, data on domestic credit growth (representing the credit market) and house price index (representing the housing market) are obtained quarterly in Ho Chi Minh City and Hanoi City, the two largest urban centres in Vietnam. This study also examines the role of several control variables in the research model, specifically economic growth and the consumer price index. To estimate the research model, the author employs the Vector Error Correction Model (VECM) for analysis. The findings demonstrate that the credit market exerts a positive impact on the housing market in Ho Chi Minh City and Hanoi City, which is particularly obvious in the long term. In addition, this study provides Vietnamese policymakers with clearer insights into this impact, offering a reliable basis for identifying appropriate solutions to promote the development of both markets, especially in the long term.

The next section of the paper outlines a literature review and clarifies the research objectives. After that, the author introduces the proposed research model, estimation methods, and research data. The study then proceeds to present the results and discuss the findings. Conclusions and recommendations are presented in the final section.

LITERATURE REVIEW

The influence of the credit market on the housing market has been widely examined in numerous studies. From a theoretical perspective, this impact is reflected through the credit effect. This theory suggests that access to credit can influence both consumption and investment. Specifically, greater access to credit can motivate households and businesses to take on more loans, thereby boosting consumption and investment within the economy. This supports wealth accumulation, resulting in increased demand for housing, which subsequently raises housing prices. Indeed, total assets and income can drive levels of consumption and investment, while real estate can be viewed as both a consumer good and an investment (Kapopoulos & Siokis, 2005; Nguyen & Bui, 2020). Furthermore, Pigou (1943, 1947) argued that real money balances can promote consumption. In addition, the consumption function theory emphasizes that wealth is a key determinant of consumption (Friedman, 1957). These theories provide a critical foundation for empirical studies aimed at elucidating the causal relationship between the credit market and the housing market.

Many empirical studies, particularly in developed countries, have explored the effect of the credit market on the housing market in the existing literature (Ibrahim & Law, 2014). Some notable empirical research on this topic includes that by Collyns and Senhadji (2002), which reported a positive effect of bank credit on housing prices in several Asian countries (Hong Kong, South Korea, Singapore, and Thailand). Additionally, in this region, Zhu (2006) examined the factors influencing housing prices in Asian economies (China, Hong Kong, Indonesia, South Korea, Singapore, and Thailand). The findings indicated a long-term relationship between macroeconomic factors and housing prices in these economies, with bank credit identified as a significant driver of housing prices (except for Indonesia, which has the least developed banking sector). In China, Liang and Cao (2007) confirmed that bank credit is positively related to the real estate market. Goodhart and Hofmann (2008) contended that bank credit is essential for driving up housing prices, which becomes particularly evident during periods of rapid price increases. McQuinn and O'Reilly (2008) suggested that the amount individuals are able to borrow from financial institutions has a substantial impact on housing prices, while other factors like income are less important. Oikarinen (2009) also found that bank credit affects housing prices in both the short and long term. Bunda

and Zorzi (2010) affirmed that the real estate market is positively influenced by bank credit, noting that excessive increases in bank credit and the real estate market can potentially cause financial crises. Gimeno and Martínez-Carrascal (2010) identified a positive effect of bank credit on the real estate market in Spain. Che et al. (2011) asserted that bank credit positively influences the real estate market in China, with this effect being more pronounced in three international financial centres (Beijing, Shanghai, and Shenzhen). Hott (2011) revealed a positive effect of bank credit on the real estate market in the United States and the United Kingdom, highlighting that the banking sector could even accelerate the formation of bubbles in the real estate markets. Xu and Chen (2012) concluded that credit policies positively affect the real estate market in 70 large and medium-sized cities throughout China. Also, Huang et al. (2015) discovered a positive effect of bank credit on the real estate market in 35 cities in China during the post-financial crisis period (after 2008). In Malaysia, Ibrahim and Law (2014) highlighted that bank credit positively affects the real estate market in both the short and long term. In Lithuania, Gasparėnienė et al. (2017) indicated a positive effect of bank credit on the real estate market. Simultaneously, Cerutti et al. (2017) reported that credit bubbles could stimulate real estate bubbles, resulting in recessions and negative consequences for the economy. In the United States, Lambertini et al. (2017) demonstrated that an increase in bank credit could boost borrowers' consumption and investment, thereby raising housing prices. Funkea et al. (2018) stated that bank credit positively influences property prices in New Zealand. Jiang et al. (2018) also found a positive impact of bank credit on the real estate market in China. In another study, Lim (2018) suggested that bank credit considerably affects the real estate market, with this influence being significant with the emergence of real estate bubbles. Chen et al. (2022) affirmed that bank credit can substantially increase housing prices in China. Additionally, Zhang and Huang (2024) confirmed that credit policies positively affect real estate prices in 35 major cities in China.

However, some suggest that excessive bank credit can exert a negative impact on the housing market. For instance, Bhatt and Kishor (2022) demonstrated that an excess of bank credit can adversely affect the housing market in 18 advanced economies; this effect is more noticeable when real estate bubbles exist.

It is evident that the influence of the credit market on the housing market has been addressed in a number of empirical studies. However, most of them have only been implemented in developed countries (Ibrahim & Law, 2014), with a lack of empirical studies in developing countries. Therefore, it is essential to investigate the impact of the credit market on the housing market in developing countries. This necessity is highlighted by the demand to provide empirical evidence that contributes to the existing literature, particularly in creating reliable evidence for policymakers in these countries to establish appropriate solutions aimed at promoting the credit market in conjunction with the housing market.

Generally, most empirical studies have reported a positive impact of the credit market on the housing market. Specifically, the former is typically measured by bank credit, while the latter is often defined by the house price index. Although some argue that excess bank credit can negatively affect the housing market (such as Bhatt & Kishor, 2022), the positive impact remains predominant in empirical research. Based on this foundation, the author conducts this study to enrich the existing literature and create empirical evidence in a developing country, specifically Vietnam, where such research is lacking. Given the findings of empirical studies and practical insights from Vietnam, the author proposes the main hypothesis (H_0) as follows: the credit market positively affects the housing market in Vietnam.

AIMS AND OBJECTIVES

This study aims to investigate the impact of the credit market on the housing market in Vietnam. Based on the findings, the author suggests recommendations to promote the credit market coupled with the housing market. Specifically, the first research objective is to analyze the impact of the credit market on the housing market using the VECM method. The subsequent one proposes implications for boosting the credit market together with the long-term development of the housing market in Vietnam.

To achieve these objectives, the author reviews previous studies and utilizes practical insights related to the research issue to construct the research model. Then, the author collects quarterly data from the first quarter of 2009 to the fourth quarter of 2022, which is the maximum period for a complete available dataset. Data on the housing market are obtained from Ho Chi Minh City and Hanoi City, the two largest cities in Vietnam. The author then employs the VECM method to estimate the research model. The findings will provide a critical foundation for Vietnamese policymakers to identify appropriate measures for fostering the credit and housing markets. Furthermore, the results will serve as meaningful empirical evidence to enrich the current literature on this topic.

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METHODS

The study employs the VECM to analyze the impact of the credit market on the housing market in Vietnam. The VECM method is superior in analyzing the effects between data series in both the short and long term, particularly in cases where the original data series are non-stationary at level I(0) but become stationary after differencing, i.e., at I(1) (Engle & Granger, 1987). Nevertheless, the VECM method should only be used to analyze long-term relationships between variables when cointegration exists in the research model (Chowdhury et al., 2024).

In this study, the author applies the VECM method to estimate the research model. The research model on the short-term impact of the credit market on the housing market is structured as follows:

$$\Delta \mathrm{Ln(HPI)}_t = \sum_{k=1}^{n} \beta_{1k} \Delta \mathrm{DC}_{t-k} + \sum_{k=1}^{n} \beta_{2k} \Delta \mathrm{Ln(GDP)}_{t-k} + \sum_{k=1}^{n} \beta_{3k} \Delta \mathrm{CPI}_{t-k} + \sum_{k=1}^{n} \beta_{4k} \Delta \mathrm{Ln(HPI)}_{t-k} + \delta EC_{t-1} + \varepsilon_t$$

Specifically, $\triangle$ represents the first difference between the variables in the model. The dependent variable (Ln(HPI)) is the logarithm of the house price index (HPI), specifically represented by the one in Ho Chi Minh City (Ln(HPI_HCM)) and the one in Hanoi city (Ln(HPI_HN)), corresponding to two specific models: Model 1 and Model 2. Data on the house price index is calculated and published by Savills Vietnam, representing the housing market. The independent variable indicating the credit market (DC) is domestic credit growth for the private sector, measured as the year-over-year growth rate. The control variables include economic growth (LnGDP), which is the logarithm of GDP, and the consumer price index (CPI), measured as the year-over-year growth of the CPI. These control variables are identified by the author based on the studies of Collyns and Senhadji (2002), McQuinn and O'Reilly (2008), and Gasparėnienė et al. (2017). The research model is analyzed separately for the housing market in Ho Chi Minh city and Hanoi city, specifically structured into Model 1 and Model 2.

Next, the long-term impact of the credit market on the housing market, through the estimated residuals from the cointegration regression, is formulated as follows:

$$EC_{t-1} = \mathrm{Ln(HPI)}_{t-1} - \alpha_1 \mathrm{DC}_{t-1} - \alpha_2 \mathrm{Ln(GDP)}_{t-1} - \alpha_3 \mathrm{CPI}_{t-1} - c$$

EC refers to the error correction term, specifically the residuals estimated from the cointegration regression.

The data are collected quarterly in Vietnam, covering the period from Q1 2009 to Q4 2022. Specifically, the data on the housing market are obtained from Savills Vietnam; the data on GDP are sourced from the General Statistics Office of Vietnam (GSO), while the data for the remaining variables in the research model are gathered from the International Monetary Fund (IMF) database.

RESULTS

In this section, the author focuses on demonstrating the findings, particularly clarifying the current situation of the research issue in Vietnam. As a developing country, Vietnam has a relatively young housing market, with the credit market being the main source of capital for the economy. During the research period, Vietnam's credit growth exhibited a slight decline between 2010 and 2015. One of the main reasons for this trend was the negative impact of the global economic crisis. In recent years, credit growth has returned, maintaining its vital role in providing capital for both the economy and the housing market. The housing market, in particular, experienced a sharp decline following the global economic crisis and persisted until 2013. One cause of this decline was the limited availability of credit for the housing sector, as the economy faced ongoing challenges. More recently, however, Vietnam's housing market has gradually recovered and resumed its growth trajectory (Figure 1).

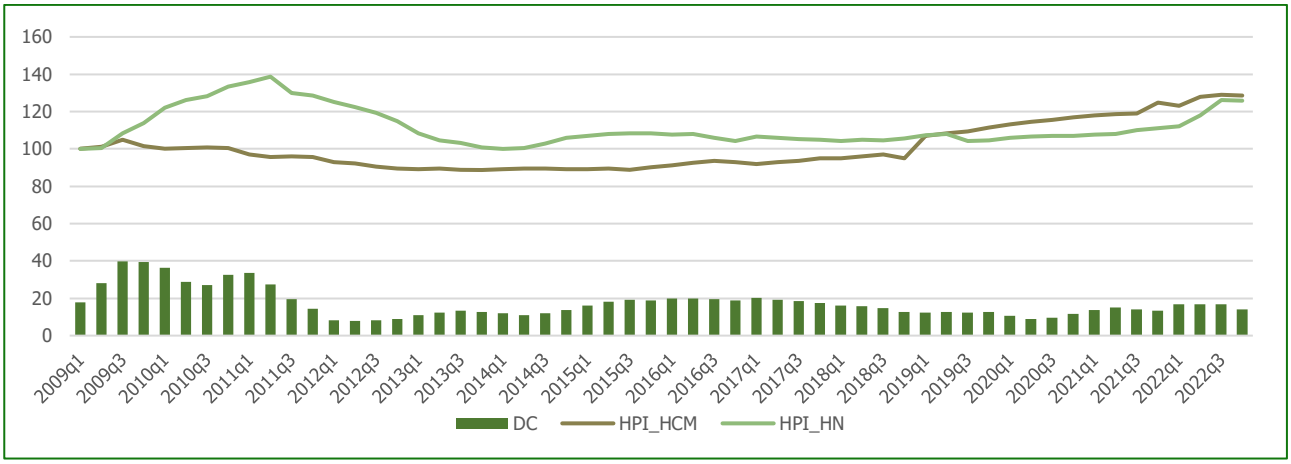

Figure 1. Domestic credit growth (DC), house price index in Ho Chi Minh City (HPI_HCM), and house price index in Hanoi City (HPI_HN) in Vietnam.

To further clarify the impact of the credit market on the housing market in Vietnam, the author estimates the research models. First, the author utilizes the Augmented Dickey-Fuller (ADF) test, which was developed by Dickey and Fuller (1979), to determine the stationarity of the data series used in the research models.

Table 1. Dickey-Fuller test. Note: *** p ≤ 0.01.

Variable	At Level	At Δ
	I(0)	I(1)
Ln(HPI_HCM)	1.04 (0.99)	-7.40*** (0.00)
Ln(HPI_HN)	-1.05 (0.73)	-3.77*** (0.00)
DC	-1.53 (0.52)	-4.70*** (0.00)
Ln(GDP)	-2.13 (0.23)	-13.91*** (0.00)
CPI	-2.29 (0.18)	-5.45*** (0.00)

Table 1 indicates that the data series in the research models are stationary at the first-order difference (I(1)) with a 1% significance level. This is one of the criteria demonstrating the appropriateness of the VECM for the research models. Next, the author selects the optimal lag for the variables, with the results presented in Table 2. Accordingly, a lag of 4 is appropriate for both models, determined based on the indicators of Likelihood Ratio (LR), Final Prediction Error (FPE), Akaike's Information Criterion (AIC), and Hannan and Quinn Information Criterion (HQIC).

Table 2. Lag selection criteria. Note: * indicates the optimal lag.

Model 1: The impact of the credit market on the housing market in Ho Chi Minh City						
lag	**LL**	**LR**	**FPE**	**AIC**	**HQIC**	**SBIC**
0	-284.99	-	0.79	11.11	11.17	11.26
1	-58.38	453.21	0.24×10-3	3.01	3.30	3.77*
2	-37.42	41.91	0.20×10-3	2.82	3.34	4.17
3	-28.23	18.40	0.27×10-3	3.09	3.83	5.04
4	13.25	82.94*	0.11×10-3*	2.11*	3.08*	4.67
Model 2: The impact of the credit market on the housing market in Hanoi city						
0	-261.64	-	0.32	10.22	10.27	10.37
1	-61.98	399.31	0.28×10-3	3.15	3.44	3.90
2	-27.60	68.75	0.14×10-3	2.45	2.96	3.80
3	-15.35	24.51	0.16×10-3	2.59	3.34	4.54
4	37.36	105.42*	0.04×10-3*	1.18*	2.16*	3.73*

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Subsequently, the author conducts a cointegration test among the data series, as proposed by Johansen (1988). The results indicate that there exists the cointegration among the data series in both research models (Table 3). Therefore, the author can employ the VECM to analyze the impact of the credit market on the housing market in Vietnam, specifically in Ho Chi Minh city (Model 1) and Hanoi city (Model 2).

Table 3. Johansen tests for cointegration. Note: * indicates cointegration

Model 1: The impact of the credit market on the housing market in Ho Chi Minh City			
Maximum rank	**LL**	**Eigenvalue**	**Trace statistic**
0	-22.15	-	70.78
1	-3.51	0.51	33.52*
2	7.31	0.34	11.87
3	10.46	0.11	5.56
4	13.25	0.10	-
Model 2: The impact of the credit market on the housing market in Hanoi city			
0	-5.23	-	85.19
1	24.19	0.68	26.33*
2	33.18	0.29	8.36
3	37.29	0.15	0.13
4	37.36	0.26×10^{-2}	-

The estimation results of the long-term impact of the variables in the two research models are presented in Table 4. Both models are significant, with all diagnostic tests confirming their appropriateness. Specifically, the LM test reports there is no autocorrelation, while White's test shows no evidence of heteroskedasticity. Thus, the estimation results of both models are valid and applicable. As anticipated, the author reveals a positive impact of bank credit on the house price index in the long term. This is consistent in both Ho Chi Minh City (Model 1) and Hanoi City (Model 2), proving the crucial role of the credit market in stimulating the housing market in Vietnam. In addition, the author identifies a positive impact of economic growth and the consumer price index on the housing market in Vietnam in the long term, which is also observed in both research models. This concludes that a favourable economic environment, characterized by appropriate levels of economic growth and rising consumer prices, serves as a crucial foundation for driving the housing market.

Table 4. Long run estimates. Note: *** $p \leq 0.01$.

Variable	**Model 1**	**Model 2**
	Ln(HPI_HCM)	**Ln(HPI_HN)**
DC	0.04*** (0.00)	0.01*** (0.00)
Ln(GDP)	0.70*** (0.00)	0.23*** (0.00)
CPI	0.11*** (0.00)	0.03*** (0.00)
Diagnostic tests		
LM test	2.48 (0.12)	0.36 (0.55)
White's test	7.66 (0.91)	52.00 (0.43)

DISCUSSION

The impact of the credit market on the housing market

The estimation results prove that bank credit positively affects the housing market, a finding consistent in both of Vietnam's largest cities, namely Ho Chi Minh City and Hanoi City. Thus, the hypothesis H_0 is accepted. This suggests that when the banking sector increases the supply of credit to the economy, the amount of capital accessible to the private sector (households and companies) increases, thereby stimulating consumption and investment. Concurrently, the demand for housing and investments in the housing market also increase, contributing to the development of the housing market. In Vietnam, bank credit continues to play a dominant role in providing financing for the economy, as well as for the housing market. Empirical evidence shows that during the period of 2011-2012, Vietnam's economy faced significant challenges, coupled with a tightening of credit policies and difficulties in accessing capital, which led to a substantial decrease in the housing market. Subsequently, as the global and domestic economies recovered, the volume of credit provided by the banking sector improved considerably, contributing to the revival of the housing market. It is obvious that bank credit can exert a positive impact on the housing market in Vietnam. Nonetheless, if bank credit increases excessively, particularly in the allocation to high-risk projects, it may pose significant risks, even the potential for housing market bubbles. This could lead to a crisis in the housing sector, as evidenced by the global economic crisis that occurred in late 2007 (Bhatt & Kishor, 2022; Bunda & Zorzi, 2010). Therefore, the increase in bank credit should be accompanied by its effective management and utilization. The findings align with the credit effect and consumption function theory (Friedman, 1957) and also support earlier observations made in most prior studies. However, what makes this study distinctive is that it offers empirical evidence regarding the impact of bank credit on housing prices in the two largest cities of Vietnam, a developing country that has lacked empirical studies on this issue.

The impact of the control variables on the housing market

The results indicate that economic growth and the consumer price index have a positive effect on housing prices, which is observed in both research models. This suggests that strong economic growth and a reasonable increase in the consumer price index can contribute to the development of the housing market. These results are consistent with what Collyns and Senhadji (2002), McQuinn and O'Reilly (2008), and Gasparėnienė et al. (2017) have affirmed.

CONCLUSIONS

This study focuses on analyzing the impact of the credit market on the housing market in Vietnam. The author utilizes quarterly data from Q1 2009 to Q4 2022. Through the VECM method, the estimation results indicate that the credit market positively affects the housing market in Vietnam's two largest cities, with this impact being particularly pronounced in the long term. This underscores the vital role of the credit market in boosting the housing market. Furthermore, the housing market is also influenced by economic growth and the consumer price index.

Based on the findings, the author suggests several recommendations for policymakers in Vietnam to promote the credit market in conjunction with the long-term development of the housing market. Specifically, Vietnam should make further efforts to maintain the dominant role of the credit market in providing capital for the economy and the housing market. Nevertheless, credit resources need to be managed and allocated effectively to avoid excessive credit expansion, which could pose significant risks to the economy and the housing market. Moreover, credit should be allocated to viable projects, including social housing, affordable commercial housing, and rental housing. Additionally, macroeconomic factors such as economic growth and the consumer price index should also be considered to stimulate the housing market.

In addition to the results obtained, this study has certain limitations, such as a limited data sample. Specifically, due to the relatively nascent feature of the housing market in Vietnam, the house price index has only been calculated and published since Q1 2009. As a result, the author could only collect data for this period. Furthermore, while the author only collects the house price index for Ho Chi Minh City and Hanoi City, the two largest cities in Vietnam, they do not represent all regions of the country. To address these limitations, future studies could compare estimation results across different regions to clarify these differences, or they could be conducted in countries where longer data samples are available.

ADDITIONAL INFORMATION

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CONFLICT OF INTEREST

The Author declares that there is no conflict of interest.

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КРЕДИТНІ ТА ЖИТЛОВІ РИНКИ У В'ЄТНАМІ: ДАНІ АНАЛІЗУ VECM

Це дослідження зосереджене на вивченні ролі кредитного ринку на ринку житла у двох найбільших містах В'єтнаму, країни, що розвивається, з обмеженими емпіричними дослідженнями з цього питання. Зокрема, кредитний ринок визначають зростанням кредитування, а ринок житла – індексом цін на житло. Набір даних збирали щоквартально з 1 кварталу 2009 року по 4 квартал 2022 року. Після використання методу моделі корекції векторних помилок (VECM), результати показують, що банківський кредит позитивно впливає на ціни на житло в довгостроковій перспективі, що спостерігається в обох найбільших містах В'єтнаму – Хошиміні та Ханої. Крім того, економічне зростання та індекс споживчих цін також суттєво впливають на ціни на житло у В'єтнамі. Ґрунтуючись на цих висновках, автор пропонує варіанти розвитку кредитного ринку в поєднанні з розвитком ринку житла. Крім того, отримані результати мають практичну цінність не лише для міст В'єтнаму, але й для інших країн, що розвиваються в усьому світі.

Ключові слова: зростання кредитування, кредитний ринок, внутрішній кредит, ринок житла, ціни на житло, VECM, В'єтнам

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