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Can Countries Manage Their Financial Conditions amid Globalization? Evidence from Vietnam

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Abstract: This research aims to determine whether global conditions influence the control of Vietnam's national financial condition or not by using internal and external variables. The financial markets in the world have been rapidly integrating into the global market that today the concept of "financial integration" is gradually being replaced by a new broader concept that is "financial globalization". That is considered an indispensable part of the process of economic globalization. However, this level of deepening integration can be seen as a factor increasing the extent of the impact of global financial conditions on financial conditions in each country. This article examines the practice in Vietnam based on comparing the FCI Vietnam index with the FCI Singapore in the period 2000-2020. The research results show that global financial conditions impact Vietnam's national financial condition index in the context of integration. By applying different methods of constructing the financial condition index, the financial condition variables show different relationships with the corresponding FCI curves.

Keywords: financial condition index, financial integration, globalization.

各国能否在全球化中管理其金融状况？来自越南的证据

摘要：本研究旨在通过使用内部和外部变量来确定全球条件是否会影响对越南国家金融状况的控制。世界金融市场正在迅速融入全球市场，如今“金融一体化”的概念正逐渐被“金融全球化”这个更广泛的新概念所取代。这被认为是经济全球化进程中不可或缺的一部分。然而，这种深化的一体化程度可以被视为增加全球金融状况对各国金融状况影响程度的一个因素。本文通过比较金融状况指数越南指数与新加坡金融状况指数在2000-2020年期间的做法，研究越南的实践。研究结果表明，全球金融状况在一体化背景下影响越南的国家金融状况指数。通过采用不同的财务状况指数构建方法，财务状况变量与对应的财务状况指数曲线呈现出不同的关系。

关键词：金融状况指数, 金融一体化, 全球化.

1. Introduction

In the current conditions of deep global economic integration, national financial conditions can be transferred across different channels. One of the principles governing monetary policy in the open economy is called the "Impossible Trilogy". That implies that policy operators can only achieve two of the three goals, which are (1) fixed exchange rate, (2) free capital flow, and (3) sovereign monetary policy. However, financial conditions can be transferred across countries through other mechanisms that cannot be fully offset by exchange rate movements [1]. Indeed, fluctuations in exchange rates also often produce changes in financial conditions, especially in open economies, whether large or small economies [2].

Meanwhile, changes in financial conditions can spread from country to country through relevant channels. For example, changes in the credit volume and other types of capital flows can have strong cross-border effects. In addition, a transmission channel is operating through hedging contracts, which can

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influence the valuation of collateral assets, thereby affecting the borrowing behavior of entities in the economy [1].

Global factors can strongly influence financial conditions in countries around the world. The "push factors" were first formulated by Calvo [3], then emphasized by many other scholars in their studies [4-6]. They show that the prices of risky assets such as stocks or corporate bonds across countries can be summarized by a global factor: the "global economic cycle". US monetary policy shocks often drive this. Therefore, Rey [7] argues that US monetary policy shocks can spread and affect national financial conditions even for inflation target economies with large financial market sizes. Moreover, the financial conditions can change with the changes in the financial conditions of other countries through a natural action mechanism since these countries have a trading relationship due to extensive financial integration with each other.

The unique characteristics of each country will determine how sensitive that country's financial conditions will be to global financial shocks. Given the prominence of the United States in the international monetary system, the U.S. national financial condition index is considered a major driver of global financial conditions. Therefore, the important considered characteristics of each country are the financial conditions that have a strong relationship with the US (such as foreign direct investment, portfolio abroad), the level of financial openness and financial development, the quality of financial institutions, the exchange rate mechanism, and so on [8-10]. For example, the financial condition index of a country with an open economy with close ties to the United States is likely to be more sensitive to global financial conditions. In contrast, countries with strong policy foundations and financial institutions with more developed financial markets are less sensitive [8, 11].

In Vietnam, integration into the international financial market is taking place more and more strongly. In terms of a legal framework, the opening of financial markets in WTO integration in particular and free trade agreements (FTAs) in general is implemented in all three ways: (1) Cross-border supply of services; (2) Consumption abroad, and (3) Commercial presence. According to the ASEAN Economic Community (AEC) integration framework, the participation in financial market integration in the AEC is divided into phases from 2008 to 2020. The period 2008 - 2015 is considered the most important period to ensure member countries have the best preparation. According to the committed roadmap, Vietnam and other countries in the region will have to open up and remove restrictions in the banking, insurance, and capital markets industries since 2015 [12].

Tran et al. [13] report that the level of financial integration of Vietnam maintained a positive trend throughout the period from 1990 to 2015, gradually narrowing the gap between financial market integration with other countries in the region such as Southeast Asia, Indonesia, Singapore as well as Japan and Korea in the Asia region based on the KOPEN index results. Besides, the KOPEN index also shows Vietnam's level of financial integration, after reaching the level of India and China in the period 1993-2007; from 2008 to 2015, this level has surpassed these countries, even surpassing Thailand. For each financial market component, the level of integration in the monetary market of Vietnam with the regional market is much higher than that of the stock and bond markets.

This research is going to examine whether or not global conditions influence the control of Vietnam's national financial condition by using variables such as (1) the economic Singapore's GDP growth; (2) the changes in foreign ownership ratio for listed firms on the Vietnamese stock market; (3) whether or not to allow trading of derivatives on the listed stock market; (4) the total capital of foreign direct investment invested in Vietnam; (5) global inflation rate; (6) and global GDP growth rate. Research results show that global financial conditions impact Vietnam's national financial condition index in the context of integration. With different methods of constructing the financial condition index, the financial condition variables will have different relationships with the corresponding FCI curves.

The rest of the paper is structured as follows: Section 2 provides a brief overview of the research topic; Section 3 explains the methodology and data used in this research; Section 4 presents the results and discusses the relationship of financial condition indicators to economic activity and; Section 5 is the conclusion of the topic.

2. Literature Review

The correlations in financial conditions across countries are not evidence of losing policy autonomy within a country but may be due to strong financial and trade integration. As countries deepen their financial integration, policymakers are more interested in policy making because of the strong correlation between domestic and international markets. On the other hand, global financial integration reduces the operating room of policymakers by weakening the transmission channels of domestic monetary policy or lessening the impact of prudential policies. That will cause countries to suffer shocks that do not come from the internal economy. When looking at domestic financial conditions, countries often consider common global components. As a result, the characteristics of countries influence the correlation between domestic financial conditions and global factors and the ability of

monetary policy to affect domestic financial conditions [14]. Deeply financially integrated countries are expected to have FCIs that are more sensitive to global financial conditions. On the other hand, countries with strong institutional and policy frameworks and well-developed financial markets are less sensitive to or mitigated by global financial shocks to national FCIs [11, 15].

Arregui et al. [14Arregui] test the correlation of the financial condition index in some emerging economies with the US financial condition index to find the strength and weakness of this correlation when forecasting different stages of the economy. The US's FCI is considered representative of global financial conditions. In the countries under the research, the authors have excluded developed countries such as Germany, Japan, and the United Kingdom, with the following research model:

$$FCI_{c,t} = \alpha_i + \beta_1 FCI_t^{US} + \beta_2 CCHAR_{c,t-1} + \beta_3 FCI_t^{US} * CCHAR_{c,t-1} + \beta_4 Z_{c,t-1} + \varepsilon_{i,t} \quad (1)$$

where:

FCI - financial condition index;

CCHAR – countries' characteristics (assess the level of trade integration and financial markets openness), including economic links with the US (foreign direct investment, banking system, portfolio, trade balance), level of financial integration, exchange rates, development of financial markets, possible regulations and laws;

Z - control variables, including global characteristics (inflation, GDP growth) and domestic characteristics (GDP growth, inflation, and trade balance status).

The research results show that countries with a closely linked financial market with the US will have a financial condition index similar to the global financial condition index. The US financial condition index will influence foreign direct investment value in countries with stock markets and a large amount out. This result coincides with the study of Sahay [10], which is mentioned that the deeper the level of financial integration of countries, the more strongly influenced by the global financial condition index; in which the authors emphasize financial conditions through variables such as value and liquidity of stock and bond market of those countries. Moreover, Osorio [16] also suggested that a larger domestic investor base, a deeply developed banking system, and a capital market could increase the resilience of emerging economies to external financial shocks.

In addition, to test how big changes or shocks in the global financial condition index or domestic monetary policy impact the national financial condition index, Arregui [14] uses VAR (panel vector autoregression) model. The research variables include the US financial condition index, the growth rate, the inflation rate, the change in the national monetary policy, the national financial condition index, and the VAR research model as follows:

$$Y_{c,t} = AY_{c,t-1} + BX_t + \varepsilon_{c,t}$$

$$Y_{c,t} = [FC_t^* \ \Delta IP_{c,t} \ \Delta CPI_{c,t} \ FCI_{c,t} \ \Delta i_{c,t}]^T \quad (2)$$

where $\Delta IP_{c,t}$, $\Delta CPI_{c,t}$, $\Delta i_{c,t}$, FC_t^* và $FCI_{c,t}$ mean industrial production growth, inflation rate, domestic monetary policy changes, domestic financial condition index, US financial condition index with specific nations (nation c, monthly i); X_t is control variables, including global growth, commodities prices, interest rate. The VAR model result shows that global financial shocks significantly impact national financial conditions. In addition, when government policy changes, it will affect the national financial index. It is interesting to note that the national financial condition index is more responsive to global financial shocks than to domestic changes. The evidence shows that the time effect and national monetary policy response are difficult to gauge.

For Asian countries, Osorio [16] uses the VAR model and Dynamic Factor Model to build financial conditions indicators for some countries to find out how the global financial index impacts those countries' financial condition index. The selected nations under the research include Australia, New Zealand, Philippines, Singapore, Thailand, Taiwan, Hong Kong, India, Indonesia, Japan, Korea, Malaysia, and China. The results show that, before the global financial crisis, national financial condition indexes of those countries are mostly affected by the stock market and credit conditions at the time of 2007. In some regions such as China, Hong Kong, Japan, and Taiwan, an exchange rate also positively affects financial conditions in general. During the global financial crisis, with the collapse of many large companies, the massive withdrawal of capital from financial institutions in the world out of the Asian market, the decrease in stock market indexes, as well as the tightening of credit conditions in some countries has led to a strong tightening of financial conditions in late 2008, early 2009. Many countries adopted aggressive monetary policies, but this did not lessen the negative impact of the drop in the stock market and credit conditions. However, during the economy recovering period (from Q2/2009 to Q1/2010), because of the strong impact of monetary policy and the rapid recovery of the stock market, there was a positive impact on financial condition indexes in the Asia Pacific region. Therefore, the stock market is the strongest factor affecting tightening financial conditions during the crisis period. Moreover, strong monetary policy in times of crisis also plays an important role in the rapid recovery of national financial conditions in many countries.

In Malaysia, Bakar & Badrudin [17] use component variables from the banking system, stock market, and foreign exchange market to construct an index of financial condition in this country. Research results show that Malaysia's FCI curve plummeted during the

Asian financial crisis (1997-1998). During this period, financial system pressures were found in most market variables, while during the global crisis (2007-2008), there was a clear difference in the volatility of the FCI curve. That is explained because most of the influencing factors are external, having a more limited impact on the Malaysian banking system. In the latest assessment, at the end of 2017, the country's FCI showed a slight decrease, reflecting the decline in the stock and foreign exchange markets.

In other Asian countries, the study of Iyke & Juhro [18] built and tested the financial condition index in Indonesia using the autoregressive vector method. The study uses data from the Indonesian central bank, official exchange rates, data from a private business association, stock price movements in the stock market, and a business confidence index to build up the financial condition index in this country. These research results are similar to the fluctuations of FCI in Malaysia, with the large fluctuations of this index in the period of 1997-2002, because at this time, Indonesia was heavily affected by the Asia financial crisis [19], leading to dramatically decrease in the FCI in the 1999-2001 period; then gradually recovered in the 2001-2002 period. Compared with FCI in other regions, the authors found that Indonesia's FCI also had similar fluctuations compared with the study of Debuque & Bautista [20]. In fact, after the crisis of 1997-1998 and 2007-2008, legislators in Indonesia have been much more cautious in operating their policies, reflected in the quarterly report released on the management position of the country's monetary policy. That leads to Indonesia's FCI line closely following the general fluctuations of the global financial market.

3. Methodology

3.1. Research Variables

Domestic and foreign financial conditions have a direct and decisive impact on the volatility of the national financial condition index, especially during global financial crisis shocks [14]. Therefore, some opinions show that it is necessary to consider the relationship between the national financial condition index and the domestic and foreign financial condition variables. According to Aizenman et al. [8], Forbes & Chinn [9], Sahay et al. [10], the important financial conditions are being considered when assessing correlation with the national financial conditions index, including a financial relationship with developed countries, the openness, and development of the financial market, the quality of financial institutions, the exchange rate mechanism, etc. The researchers support the idea that examining the relationship between the national financial condition index and domestic and foreign financial conditions contributes to building a national financial condition index and supports increasing of open financial market and getting closer to the financial conditions of other countries, especially the developed ones such as the US. Therefore, if relevant variables are observed, it is possible to predict global financial conditions and financial crises.

However, Obstfeld [1] believes that observing macro factors, the relationships of the real economy (such as trade relations) should not be included when considering the relationship between the international environment and the national financial condition index. In addition, the exchange rate mechanism also has little impact on the transmission of financial conditions across countries. The financial conditions work through many other variables without only considering the exchange rate mechanism.

In the research of Arregui et al. [14] on understanding the relationship between the national financial condition index and financial conditions within and outside the region, to find out whether countries can control financial conditions in the context of integration or not. In their study, Arregui et al. [14] do the research in developed and developing countries (namely Argentina, Australia, Austria, Belgium, Bulgaria, Canada, Chile, China, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, India, Indonesia, Israel, Italy, Japan, Korea, Malaysia, Mexico, Netherlands, New Zealand, Norway, Philippines, Poland, Russia, Turkey, South Africa, Spain, Sweden, Thailand, UK, USA, Vietnam); and mainly take the US as a reference in the research model, with the equation:

$$FCI_{c,t} = \alpha_i + \beta_1 FCI_t^{US} + \beta_2 CCHAR_{c,t-1} + \beta_3 FCI_t^{US} * CCHAR_{c,t-1} + \beta_4 Z_{c,t-1} + \varepsilon_{i,t} \quad (3)$$

where FCI is the financial condition. CCHAR is national characteristics (assessing the degree of trade integration and openness of financial markets), including economic links with the US (foreign direct investment, banking system, portfolio, trade), exchange rates, the development of financial markets, regulation. Z: control variables, including global variables (inflation, growth rate) and domestic variables (growth, inflation, trade balance).

The research results show that for countries whose financial condition index is affected by global financial conditions. As a result, domestic financial conditions tend to be closely related to foreign financial condition variables. In particular, the financial condition indexes of countries with close financial links to the US tend to fluctuate closely with global financial conditions. Arregui et al. [14] found that observing foreign direct investment is better than observing portfolio variables in markets. The reason is that foreign investment is often considered a long-term variable, less subject to large changes over time, excluding major shocks, special events, or financial crises, and could be

expressed fairly well in the financial condition index.

In this research, we will apply the research model of Arregui et al. [14], which adjusts some variables to suit the research conditions of the financial condition index in Vietnam. To determine the relationship between Vietnam's national financial condition index and domestic and international financial conditions. Accordingly, the research model will be:

$$FCI_t^{vn} = \alpha + \beta_1 GDP_t^{Sing} + \beta_2 CCHAR_{t-1} + \beta_3 Z_{i,t-1} + \varepsilon_{i,t} \quad (4)$$

where FCI_t^{vn} is the national financial condition index in year t; α is the intercept factor; GDP_t^{Sing} is an industrial index of Singapore in year t; the reason is that Singapore is considered a benchmark country for the regional market closest to Vietnam in terms of integration and development. Moreover, when Osorio et al. [16] study the FCI index of Asian countries, the research results show that Singapore's GDP and FCI move in the same direction. Therefore, in this study, because FCI data for Singapore could not be obtained, the research team used the GDP data instead. $CHAR_{i,t-1}$ is the financial characteristics of Vietnam in year t-1. The research variables of CCHAR include: (1) Openness of the financial market; the research used the level of foreign investors' ownership for listed companies in Vietnam; (2) The application of derivatives in the stock market; (3) Foreign direct investment capital into Vietnam over time. $Z_{i,t-1}$ is the control variable for region *i* in year *t*-1; including (1) world inflation index; (2) world GDP growth rate.

Table 1 Research variables

Research variable	Symbol	Meaning
Dependent variable		
Vietnam financial condition index	FCI-Vn	Using Vietnam FCI from Tran et al. [4]
Independent variables		
Singapore's GDP growth	GDP-Sing	Singapore's GDP growth, yearly
The level of foreign investors' ownership of listed companies in Vietnam	FOR.OW	Ordered variable, value 1 of full foreign investor ownership is 49%; value 2 if the maximum is 100% unless company rule has exclusion terms; value 3 if the maximum is 100%, without depending on company rules, unless the government regulates special circumstances.
Using derivatives in the Vietnam stock market	DERI	Dummy variable: value 1 if the use of derivatives is permitted at that time; otherwise, value 0
Foreign direct investment	FDI	Logarithm of foreign direct investment value in Vietnam
Control variables		
Global inflation rate	CPI-world	Global inflation rate
Global GDP growth	GDP-world	Global GDP growth

3.2. Research Hypotheses

This research aims to find out the relationship between the national financial condition index of Vietnam in terms of integration with domestic and international financial conditions. The research hypotheses are as below:

H_0: Domestic and international financial conditions do not affect Vietnam's national financial condition index in the context of integration.

H_1: Domestic and international financial conditions affect Vietnam's national financial condition index in the context of integration.

4. Research Results

In order to test the relationship between Vietnam's national financial condition index in the context of integration with domestic and international financial conditions, the research team uses the correlation coefficient test method and the single regression method (OLS), performed on Stata 14 software. Table 2 presents the results of the correlation between the dependent variable, the independent variable, and the control variable in the model, showing the GDP growth rate of Singapore (GDP-Sing), the changes in foreign ownership proportion (FOR.OW) for listed companies in Vietnam, the permission to trade derivatives (DERI) on the stock market, or the global growth rate GDP (GDP- world) having a positive correlation with Vietnam's FCI by PCA method. Meanwhile, the financial condition of the value of foreign direct investment (FDI) in Vietnam, the global inflation rate (CPI-world) is negatively correlated with Vietnam's FCI in integration.

Table 2 Correlation coefficient result (Research result from Stata 14)

	FCI-Vn (PCA)	GDP-Sing	FOR.OW	DERI	FDI	CPI-world	GDP-world
FCI-Vn (PCA)	1						
GDP-Sing	0,2471*	1					
FOR.OW	0,0182	-0,3794*	1				
DERI	0,0003	-0,2538*	0,7195*	1			
FDI	-0,1494*	-0,3592*	0,6854*	0,6450*	1		
CPI-world	-0,1007*	0,5309*	-0,4448*	-0,1657	-0,5355*	1	
GDP-world	0,0009	0,2531*	0,2237*	0,0932	0,2620*	-0,3010*	1

* Significant at 5%

Among these financial condition variables, the variables GDP-Sing, FDI, and CPI-world have statistical significance at 5%, reaching the correlation values of 0.2471; -0.1494; and -0.1007, respectively. Regarding the correlation of other financial condition variables in this study, according to the results from Table 2, the foreign ownership variable has a rather strong relationship with the domestic financial condition of Vietnam, such as (+) 0.7195 with the variable DERI; (+) 0.6854 with the variable FDI. It means that the changes in the foreign ownership ratio, such as loosening or tightening the foreign ownership ratio for listed companies, have a great impact on attracting foreign direct investment capital to Vietnam. Also, derivatives in securities trading impact the government's exchange rate policy.

4.1. Measuring the Correlation Coefficient between Financial Condition Variables and FCI According to the Inflation Rate (CPI) by the VAR Method

Table 3 shows that, by using the VAR model to build the financial condition index of Vietnam according to the inflation rate (CPI), most of the financial condition variables impact the FCI index at the 5% level of statistical significance. That includes the GDP growth rate of Singapore, the change of foreign ownership ratio for listed companies on the Vietnam stock market; the permission to use derivatives on the Vietnamese stock market; the value of foreign direct investment capital into Vietnam; and global GDP growth rate is positively correlated with the volatility of Vietnam's financial condition index according to the inflation rate. However, the global inflation rate is negatively correlated with the FCI, with a value of (-) 0.3523. Considering other financial condition variables correlated with FCI, most of the correlation values range from 0.3 to 0.6; and mostly reached the 5% level of statistical significance.

Table 3 Results of measuring the correlation coefficient with the variable FCI financial conditions by inflation rate (CPI) according to VAR (Research result from Stata 14)

	FCI-VAR(CPI)	**GDP-Sing**	**FOR.OW**	**DERI**	**FDI**	**CPI-world**	**GDP-world**
FCI-VAR(CPI)	1						
GDP-Sing	0.1446	1					
FOR.OW	0.3904*	-0.3794*	1				
DERI	0.4745*	-0.2538*	0.7195*	1			
FDI	0.3474*	-0.3592*	0.6854*	0.6450*	1		
CPI-world	-0.3523*	0.5309*	-0.4448*	-0.1657	-0.5355*	1	
GDP-world	0.6341*	0.2531*	0.2237*	0.0932	0.2620*	-0.3010*	1

* Significant at 5%

4.2. Measuring the Correlation Coefficient between Financial Condition Variables and FCI According to the Vietnam Industrial Index (IPI) by the VAR Method

With the use of the Vietnam industrial index in the construction of the FCI index by the VAR method, table 4 shows that 4 financial condition variables have a negative correlation with the FCI financial condition index in Vietnam, including the change of foreign ownership ratio for listed firms in the Vietnam stock market (FOR.OW); the permission to use derivatives in Vietnam's stock market (DERI); the value of foreign direct investment capital in Vietnam (FDI); and the growth rate of global GDP (GDP-world); with correlation values of (-) 0,2010; (-) 0.3862; (-) 0.4427; and (-) 0.1143, respectively; in which, there are 3 variables with 5% significance level, including FOR.OW, DERI, and FDI. In addition, there are two variables of financial condition that are positively correlated with the FCI financial condition index: the GDP growth rate of Singapore (GDP-Sing) and the global inflation rate (CPI-world), with correlation values of 0.0518 and 0.1291, respectively.

Table 4 Results of measuring the correlation coefficient with the financial condition variables FCI according to Vietnam industrial index (IPI) by using VAR (Research result from Stata 14)

	FCI-VAR (IPI)	**GDP-Sing**	**FOR.OW**	**DERI**	**FDI**	**CPI-world**	**GDP-world**
FCI-VAR (IPI)	1						
GDP-Sing	0.0518	1					
FOR.OW	-0.2010*	-0.3794*	1				
DERI	-0.3862*	-0.2538*	0.7195*	1			
FDI	-0.4427*	-0.3592*	0.6854*	0.6450*	1		
CPI-world	0.1291	0.5309*	-0.4448*	-0.1657	-0.5355*	1	
GDP-world	-0.1143	0.2531*	0.2237*	0.0932	0.2620*	-0.3010*	1

* Significant at 5%

4.3. Results from the Regression Model

This study uses a regression model to examine the relationship between the financial condition variables and the financial condition index of Vietnam in the context of integration. The research team uses 3 financial condition indexes built in the previous section as dependent variables, which are (1) the financial condition index built by the PCA method (FCI-PCA); (2) the financial condition index according to the inflation rate (CPI) using VAR method (FCI-VAR (CPI)); and (3) financial condition index by Vietnam industrial index (IPI) by VAR method (FCI-VAR (IPI)). These regression models aim to measure financial condition variables that affect the financial condition index by which method is stronger and more reliable.

4.4. Financial Condition Index According to the PCA Method

The results from the OLS regression model in Table 4 show that out of 6 variables of domestic and international financial conditions, there are 4 variables with a p-value < 5%, which is statistically significant, they are (1) GDP growth rate of Singapore; (2) Decisions on foreign ownership of listed companies in the Vietnamese stock market; (3) Value of foreign direct investment in Vietnam; and (4) Global GDP growth rate.

From the regression model results, we found that the GDP growth rate of Singapore (GDP-Sing) has a negative relationship with the national financial condition index of Vietnam, with the p-value reaching 0.043 and the coefficient value reached to -12,116. That means that when Singapore's GDP increases over time, the financial condition index of Vietnam will decrease, and vice versa. Moreover, the value of a foreign direct investment in Vietnam (FDI) and the growth rate of global GDP (GDP-world) are also negatively related to the volatility of Vietnam's financial condition index, with p-values of 0.000 and 0.027, respectively.

Therefore, when observing the FDI and GDP-world fluctuation direction through data reporting cycles, policymakers can rely on this to predict the direction of fluctuations in Vietnam's FCI and then make appropriate decisions. In contrast, the financial condition variable of foreign ownership proportion for listed companies in the Vietnam stock market (FOR.OW) has a positive relationship with the volatility of Vietnam's financial condition index, with p-value = 0.028 < 0.05; whole FOR.OW has a value of 1.102. In addition, the regression model also shows the application of derivatives in trading on the Vietnamese stock market (DERI) and the global inflation rate (CPI-world) having a positive relationship with Vietnam's financial condition index in the context of integration. However, these financial condition variables are not statistically significant due to their p-value > 0.05.

Table 6 OLS regression model results with different dependent variables (Research result from Stata 14)

	FCI-PCA		**FCI-VAR (CPI)**		**FCI-VAR (IPI)**	
	Coef.	**p-value**	**Coef.**	**p-value**	**Coef.**	**p-value**
GDP-Sing	-12,116	0,043	3,743	0,000	-1,321	0,180
FOR.OW	1,102	0,028	-0,148	0,010	0,571	0,000
DERI	0,420	0,204	0,133	0,008	-0,186	0,019
FDI	-5,595	0,000	0,295	0,016	-1,351	0,000
CPI-world	27,400	0,137	-0,563	0,000	-1,386	0,502
GDP-world	-24,073	0,027	6,815	0,000	0,728	0,740
_cons	9,904	0,791	-6,655	0,017	30,452	0,000
Significant F	0,000		0,000		0,000	
R-Square	0,2894		0.6126		0.4304	

* Significant at 5%

4.5. Financial Condition Index by Inflation Rate using the VAR Method - FCI-VAR (CPI)

Table 6 also shows that by using the VAR method to calculate the financial condition index of Vietnam in the context of integration, according to the inflation rate (CPI), with a very large R-Square value, reaching 0.6126. It means that the financial condition variables in the model can explain 61.26% of the variation of the financial condition index of Vietnam. Interestingly, with this method, all p-values of the independent and control variables are statistically significant (p-value < 0.05). According to this method, the GDP growth rate of Singapore, the application of derivatives trading on the Vietnamese stock market, the value of foreign direct investment capital into Vietnam, and the growth rate of global GDP have positively impacted the financial condition index of Vietnam in the context of integration.

However, the changes in the foreign ownership ratio in the listed stock market in Vietnam and the global inflation rate positively affect Vietnam's FCI. With this method, the financial condition variables affecting the financial condition index of Vietnam are consistent with the general theory of economics; when the growth rate of a developed country (Singapore), the growth rate of the world will affect foreign direct investment in Vietnam in the same direction.

4.6. Financial Condition Index According to Vietnam Industrial Index (IPI) by VAR Method – FCI-VAR (IPI)

In determining Vietnam's financial condition index in the context of integration according to Vietnam's industrial index (IPI), with the Significant F value having statistical significance, the research model can be used. At the same time, the R-Square value reached 0.4304, which means that the financial condition variables can explain 43.04% of the fluctuations of the FCI index if built by this method. Table 7 shows that of the 6 researched financial condition variables, 3 variables are statistically significant (with p-value < 0.05). That can explain the fluctuations of the FCI over time; they are the changes in foreign ownership ratio for listed firms on the Vietnam stock market; the use of derivative securities in transactions on the Vietnamese stock market. The value of foreign direct investment capital shows FDI and DERI having opposite movements with FCI, while FOR.OW moves in the same direction as FCI, with correlation values -1.351, -0.186, and 0.571, respectively. In addition, other variables have a p-value > 0.05, so there is no statistical significance, which is Singapore's GDP growth rate, global inflation rate, and global GDP growth rate.

Table 7 Research hypotheses results (Research result from Stata 14)

	PCA		**CPI**		**IPI**	
Variables	Measuring hypotheses result	Impact direction	Measuring hypotheses result	Impact direction	Measuring hypotheses result	Impact direction
GDP-Sing	Negative impact	(-)	Positive impact	(+)	No statistical significance	N/A
FOR.OW	Positive impact	(+)	Negative impact	(-)	Positive impact	(+)
DERI	No statistical significance	N/A	Positive impact	(+)	Negative impact	(-)
FDI	Negative impact	(-)	Positive impact	(+)	Negative impact	(-)
CPI-world	No statistical significance	N/A	Negative impact	(-)	No statistical significance	N/A
GDP-world	Negative impact	(-)	Positive impact	(+)	No statistical significance	N/A

* Significant at 5%

Therefore, from the above results, the research concludes to reject hypothesis H_0 and accept the research hypothesis H_1: domestic and foreign financial conditions have an impact on Vietnam's national financial conditions index (FCI-Vn) in the context of integration. With different methods of constructing the financial condition index, the financial condition variables will have different relationships with the respective FCI curves.

5. Conclusion

This research examined the influence of global financial conditions on the national financial condition of Vietnam, using variables such as (1) Singapore's GDP growth rate; (2) the change in foreign ownership ratio of listed firms on the Vietnamese stock market; (3) whether or not to allow trading of derivatives on the stock market; (4) the value of a foreign direct investment in Vietnam; (5) global inflation rate; (6) and global GDP growth rate. Research results show that global financial conditions impact Vietnam's national financial condition index in the context of integration. With different methods of constructing the financial condition index, the financial condition variables will have different relationships with the respective FCI curves. For example, if Vietnam's financial condition index were built by the PCA method, the external variables such as GDP-Sing, FDI, and GDP-world would have negatively impacted on financial condition index. In contrast, foreign ownership in the stock market (FOR.OW) positively impacts. Using the VAR method, according to the inflation rate (CPI), we find out that Singapore's GDP, FDI, global GDP, and the using derivatives permission in the Vietnam stock market have positively impacted Vietnam's financial condition. However, foreign ownership of listed firms and the world's inflation rate has negatively influenced this index. In addition, when using the PCA method according to Vietnam industrial index (IPI), the results show that foreign ownership has a positive impact. However, the derivatives used in the stock market and FDI have negatively impacted Vietnam's financial condition index. However, in testing how the relationship of financial conditions affects the financial condition index, the research team reuses the research results of Tran et al. [21] and Phuong et al. [22] on the FCI index. They show that the data on the construction of the financial condition index of Vietnam in the context of integration is built on monthly data.

In contrast, the data on the value of foreign direct investment (FDI) (FDI), Singapore's GDP growth rate, and global GDP is collected by year-to-date data. The method of converting to monthly data is then used, based on algorithms of Stata software. Therefore, the limitation of this research is that the inferring data may face the problem that the accuracy of each month is not completely accurate compared to the actual situation. However, in the long term, the data on the economic

growth rate of Singapore, the world, and the value of the foreign direct investment in Vietnam are still accurate numbers, reflecting the fluctuations of the country's datasets. Therefore, in the short term, the research results may not accurately reflect the correlation between the variables; however, in the long term, the reliability of the data series and the research results are still accurate, reflecting the right direction of the impact of the research variables on each other.

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