Foreign Capital Flows, Banking Stability and the Role of International Trade Cooperation and Distribution an Empirical Analysis from the ASEAN Region[*]

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Abstract

Purpose: Although foreign capital flows have played a vital role in fostering the economic growth in recipient countries, there are some concerns about the adverse impact of international capital flows on the banking stability. Hence, the study revisits this issue to explore the relationship between the different types of foreign investments and banking stability in ASEAN region. **Research design, data and methodology:** Based on the bank-level data of 96 commercial banks and country-level in six ASEAN countries from 2008 to 2019, we perform the multivariate regression analysis and provide a variety of robustness tests. **Results:** Our empirical evidence shows the volatility of foreign portfolio investments has significantly negative effect on the banking stability, besides that of foreign other investments has the similar influence but the result is relatively less pronounced in some robustness tests. Additionally, increasing trade cooperation and international distribution may lead countries to face higher risk of banking instability driven from these international investments. Meanwhile, the impact of foreign direct investments is positive, but the evidence is the least obvious. **Conclusions:** Our findings suggest policy-makers in ASEAN and emerging nations as a whole should carefully consider when building policies-related to mitigate the adverse impact of foreign capital flows.

Keywords: Foreign Capital Flows; Banking Stability; Distribution; International Trade Cooperation; ASEAN countries.

JEL Classification Codes: E44, F41.

1. Introduction

The volatility of international capital flows has always received much attention from policy-makers as well as academics, however, the empirical evidence of the link between foreign capital movements and potential consequences of these flows still remains controversial, especially in developing countries. Under the positive aspect, on the one hand, such increasing foreign investments may bring enormous benefits for a nation. For instance, they can help to enhance financial resources and boost domestic financial system to be more stable (Kaminsky & Schmukler, 2008); or they also foster local firms to further engage with global supply chains and distribution networks (Imansyah & Nasrudin, 2016). From the negative dimension, foreign

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capital can lead both economic system and financial one to face the risk of instability and increasing a probability of banking crisis (Kim & Singal, 2000). Therefore, through the study, we will revisit this field by exploring the effect of different types of international capital flows on the stability of banking system based on the landscape of ASEAN region.

With that in mind, our paper is conducted to shed more light on two important questions. Because the relationship between foreign investments and banking system in particular and financial system in general might depend on the different components of these capital flows (Hegerty, 2011), the study will answer the first question of what kinds of capital flows will play a vital role in impacting on the stability of banks. Furthermore, the recent finding of Nguyen (2022) supports the view that regulators should increase adjustments about trade cooperation and international distribution to attract more foreign investments into domestic economy. Hence, we continue to answer the second question of whether increasing trade openness plays a vital role in our main concern or not. In this vein, ASEAN region is one of appropriate environments to help us seek clearly these questions due to a variety of reason as follows.

First of all, ASEAN countries have been becoming one of the most important areas in the global economy, especially about the pace of economic development, however financial and banking system are still considered underdevelopment compared to other industrialized nations (Ho & Saadaoui, 2022). Consequently, the economic growth relies most on external capital flows and the stability of banks to fuel the development (Le, 2020). Thus, every volatility of foreign investments and the instability of banks can make these nations face more vulnerability that the 1997-1998 Asian financial crisis indicated before. Moreover, such orientation to depending on increasing export, these nations have the tendency in further opening trade activities to attract more foreign investors and to strengthen domestic economic system (Ho & Saadaoui, 2022; Lim & Ho, 2013). Meanwhile, as the aftermath of the Asian financial crisis, ASEAN countries have undergone the crucial changes in banking system such as deregulation, privatization, liberalization, etc. (Chan, Koh, Zainir, & Yong, 2015). Taken together, domestic banks in this region will easily exposure to external shocks, particularly increasing and decreasing of foreign investments. This, in turn, will give me a pertinent opportunity to revisit the impact of international capital flows on the stability of ASEAN banks and to discover the role of trade cooperation and international distribution in this effect.

To reach clear answers about our main concerns, we use the sample of 96 commercial banks in six ASEAN countries including: Philippines, Indonesia, Malaysia, Thailand, Singapore and Vietnam, and the period spanning from 2008 to 2019. The data collected from Datastream source for bank-level and from International Monetary Fund database, World Bank World Development Indicators for macroeconomic variables, obtains total over 1,000 observations. We choose these nations because of, to some extent, they have some common characteristics such as good performances about economic development, underdeveloped banking system and orientating to growth relying on export activities as Ho and Saadaoui (2022) implied that. Also, the selected period covering a long time from the global financial crisis to the recent year, 2019, will provide the overall picture for us in investigating the impact of foreign investments on the instability of banks in this area. To some extent, this period has been witnessing a rapid increase in the liquidity of foreign capital over global. We also respectively employ multivariate regression analysis, control a variety of banking characteristics and macroeconomic conditions in each country, and provide several robustness tests consisting of: (i) performing alternative measure for the dependent variable, which is (the natural logarithm of) Zscore used as the proxy of banking stability; (ii) lagging one period of the main explanatory variables, which are the different kinds of foreign capital flows; and (iii) re-performing our baseline model with some alternative econometric approaches.

Our empirical analysis indicates that the volatility of portfolio investments plays a major role in creating the adverse impact on the stability of banks in comparison with that of other foreign capital flows consisting of direct investments and other investments. Additionally, even though the volatility of other investments has also similar influence to that of portfolio investments, it is relatively less pronounced in some robustness tests. By contrast, for direct investments, the result shows the positive association with the banking stability, but the level of effect is the least obvious. Besides, we also find that the adverse impact of both foreign portfolio investment flows and foreign other investment flows is too pronounced in countries having higher trade openness.

Our findings in this paper contribute to the existence of large body of literature in several ways as follows. First, our empirical evidence again confirms the concerns about the increase in volume of gross cross-border capital flows through transmission channel of banking system may raise the instability of domestic financial system, especially in emerging countries (see more: Banerjee, Devereux, & Lombardo, 2016; Bruno & Shin, 2017; Furceri, Guichard, & Rusticelli, 2012). Furthermore, while some recent studies focus on the impact of indirect investment flows on the stock market (Derbali & Lamouchi, 2020), or the bond and exchange market (Anggitawati & Ekaputra, 2020), we make a difference when exploring the effect of the volatility of various foreign capital flows on the stability of banking system, where is seen as the backbone of economic growth

in every developing country. In addition, although there are some recent calls for regulators in emerging countries need to further open trade cooperation and international distribution to attract more foreign investors (Nguyen, 2022), our result regression implies that governments should cautiously consider when building policies related to attract foreign investments, especially international portfolio investors. Again, we believe that this paper is so useful for both policy-makers and regulators in ASEAN region and developing nations as a whole.

The remainder of the paper is constructed as follows. In the next section we conduct to review the related literature, while the data and variables are described in section 3. Section 4 depicts the main result and some robustness tests. We examine the role of trade openness in section 5. Finally, we conclude our main findings in the last section.

2. Related Literature

There are some certain attempts to evaluate the effect of foreign capital flows according to separately various types consisting of foreign direct investments (FDI), foreign portfolio investments (FPI) and foreign other investments (FOI). However, the empirical evidence still maintains an open question. It seems to be that the influence of these capital flows brings both benefits and drawbacks for financial system in particular and domestic economy in general.

Regardless of the different conclusions about this issue, there is overall certain consensus among academics about necessary needs for attracting more FDI due to the advantages that this type of capital will generate. For instance, Imansyah and Nasrudin (2016) suggest that FDI will help to promote the ability of domestic firms in enhancing the up-to-date technological system, building management models and leading them to further interacting with the global value chains as well as the global distribution networks. Hence, FDI has played a vital role in fostering the economic growth of recipient countries, which have enough human and financial resources (Alfaro, Chanda, Kalemli-Ozcan, & Sayek, 2010; Borensztein, De Gregorio, & Lee, 1998). One of main reasons supporting the benefits of FDI flows is that they are seen as the least volatility compared with other types of foreign capital flows. At the same time, they usually involve with long term investments into fixed assets, and thus they are often less fluctuation even in during crises in emerging countries (Sula & Willett, 2009). But there are also some concerns about such FDI flows that appear in recent studies. Accordingly, these capital flows not only reflect purely investments into recipient countries or territories, but also are used for purposes of reducing tax liabilities of foreign institutions. In this vein, the emergence

of FDI flows will be similar to FPI and FOI flows. Therefore, FDI flows may not be completely stable as previous studies have indicated and they can create certain instability in the short term (Blanchard, Ostry, Ghosh, & Chamon, 2016). This argument, in turn, continues to raise an open question on the consequences of the volatility of FDI flows.

Meanwhile, having much financial literature has emphasized the aspect of adverse effect coming from FPI and FOI flows. For instance, Combes, Kinda and Plane (2012) find that FPI flows have strongly positive association with increase in real value of domestic currency leading the risk of economic uncertainty. The study of Igan and Tan (2017) also considers a similar result in which FOI flows have a major role in increasing domestic credit. Such sudden growth of credit is seen as an important part of reasons that will cause domestic economy and financial system to face the risk of instability. Also, easily accessing external capital could make local banks reduce the standards of lending and loan quality. At a result, a credit boom means that faster asset prices, higher inflation rate and higher threat of unsustainability (Bruno & Shin, 2014). Using the country-level data of 53 emerging countries and the period spanning from 1980 to 2013, the empirical results of Ghosh, Ostry, and Qureshi (2015) confirm these arguments. Accordingly, the authors' evidence shows that FPI and FOI flows have negative association with the instability of both macroeconomy and financial system. Additionally, these flows also cause the increase in domestic credit and higher risk of banking crisis. However, by contrast, some studies have an opposite view. For example, Levine (2001) considers that such FPI and FOI flows contribute to foster the liquidity of stock market and to enhance the productivity as well as economic growth in recipient countries. Moreover, the author indicates that the appearance of foreign banks will trigger the efficient operation of local banks. Therefore, the influence of these flows again remains inclusive. Such remaining an open question give us a chance to conduct the study by providing the empirical evidence in ASEAN countries.

Combination with studies mentioned above, we construct the hypotheses as follows.

H1: The volatility of FDI flows will have a positive effect on the stability of domestic banks.

H2: The volatility of FPI and FOI flows will have a negative association with the stability of domestic banks.

For the role of trade cooperation and international distribution, some studies suggest that higher trade openness will help host countries attract more foreign capital flows and domestic industries interact more with the global value chains (Dang & Nguyen, 2021; Nguyen, 2022). In addition, FPI and FOI flows are usually seen as the most important

factors in increasing banking instability in countries having higher trade openness compared to FDI flows (Daniel & Jones, 2007). Therefore, we continue to build the next hypotheses as follows.

H3: The adverse impact of the volatility of FPI and FOI flows on banking stability will be more pronounced in countries having higher trade openness.

H4: The positive effect of the volatility of FDI flows on banking stability will be clearer in countries having higher trade openness.

3. Data and Variables

As we mentioned in section 1, we collect bank-level data from Datastream source and macroeconomic indicators from International Monetary Fund database and World Bank World Development Indicators. Our period spans from 2008 to 2019 and total banks in the sample is 96 banks from six ASEAN countries: Philippines, Indonesia, Malaysia, Thailand, Singapore and Vietnam.

To evaluate the volatility of different types of foreign capital flows, we use the ratio of net portfolio flows to GDP (PINVEST), the ratio of net other investment flows to GDP (OINVEST) and the ratio of net foreign direct investment flows to GDP (DINVEST). These indicators – our

explanatory variables - are widely performed in related literature (Blanchard et al., 2016; Ghosh, Ostry, & Qureshi, 2015). To estimate the stability of banks, we use the natural logarithm of Zscore indicator as the proxy of the dependent variable. This indicator presents for the insolvency risk of banks and it is widely used in financial literature (e.g., Laeven & Levine, 2009; Phan, Iyke, Sharma, & Affandi, 2021). A bank having a higher Zscore means that lower risk of insolvency. We use the natural logarithm of Zscore instead of Zscore because, as these authors have indicated, Zscore can be skewed measure. We will call Zscore as the natural logarithm of Zscore in the rest of paper.

Additionally, we control various bank-specific variables including: the natural logarithm total assets (SIZE); the capital ratio (CAPITAL), the total loans to total assets ratio (LOANSHARE); the total deposits to total assets ratio (DEPOSITSHARE). At the same time, we also control some country-level variables consisting of: the annual GDP growth (GDP); the inflation rate (INF); the natural logarithm of annual GDP per capita (GDPCAP). These control variables are largely used in literature (e.g. Phan et al., 2021; Tran, Nguyen, & Lu, 2021).

Our dataset obtains about 1,000 observations for 96 banks in six countries. All variables are winsorized at 1% level on the top and bottom of their distribution to eliminate the effect of outliers. The table 1 depicts the definition of variables, and the Table 2 presents the descriptive statistics (Panel A) as well as the correlation matrix (Panel B).

Table 1: Variables Definitions
The table depicts definitions of all main variables used in our paper.

Variables	Definitions	Source
ZSCORE	The sum of average ROA and the equity-to-total assets ratio, divided by the standard deviation of ROA. A two-year moving windows is used to estimate the average and the standard deviation of ROA. Following Laeven and Levine (2009); Phan et al. (2021), we use the natural logarithm of Zscore.	The authors estimate from the audited financial statements
LLR (%)	The loan loss reserve ratio	Datastream
PINVEST (%)	The ratio of net portfolio flows to GDP	International Monetary Fund database
OINVEST (%)	The ratio of net other investment flows to GDP	International Monetary Fund database
DINVEST (%)	The ratio of net foreign direct investment flows to GDP	International Monetary Fund database
SIZE	The natural logarithm of total assets of banks	Datastream
CAPITAL (%)	The book value of equity over gross total assets of banks	Datastream
LOANSHARE (%)	The ratio of total loan to total assets of banks	Datastream
DEPOSITSHARE (%)	The ratio of total deposits to total assets of banks	Datastream
GDP (%)	The annual GDP growth in each country	World Bank World Development Indicators
INF (%)	The annual inflation rate in each country	World Bank World Development Indicators
GDPCAP	The natural logarithm of annual GDP per capita in each country	World Bank World Development Indicators

Table 2: Summary Statistics
Two tables below describe the summary statistics as well as the correlation matrix for our sample including 96 commercial banks in six ASEAN countries from 2008 to 2019 performed in the paper. We conduct to winsorize all variables at 1% and 99% levels.

Panel A: Variables descriptive statistics

	(1)	(2)	(3)	(4)	(5)
VARIABLES	N	mean	sd	min	max
ZSCORE	683	4.606	1.320	1.967	8.055
LLR	1,118	0.00422	0.0176	-0.108	0.0468
PINVEST	1,152	0.00957	0.0199	-0.0756	0.0861
OINVEST	1,152	0.0144	0.0246	-0.0221	0.171
DINVEST	1,152	0.0347	0.0339	0.00487	0.227
SIZE	1,139	22.51	3.018	15.24	27.83
CAPITAL	1,138	0.140	0.0567	0.0416	0.387
LOANSHARE	1,139	0.643	0.142	0.216	0.944
DEPOSITSHARE	1,137	0.715	0.111	0.251	0.893
GDP	1,152	0.0529	0.0164	-0.00691	0.0751
INF	1,152	0.0458	0.0412	-0.00639	0.199
GDPCAP	1,152	8.263	0.688	7.277	10.96

Panel B: Correlation matrix (pairwise)
Pairwise correlations

Variables	(ZSCORE)	(PINVEST)	(OINVEST)	(DINVEST)	(SIZE)	(CAPITAL)	(LOANSHARE)	(DEPOSITSHARE)	(GDP)	(INF)	(GDPCAP)
ZSCORE	1.000										
PINVEST	-0.072	1.000									
	(0.059)										
OINVEST	-0.044	0.064*	1.000								
	(0.250)	(0.029)									
DINVEST	0.048	-0.073*	0.781*	1.000							
	(0.209)	(0.013)	(0.000)								
SIZE	-0.156*	0.051	0.037	0.009	1.000						
	(0.000)	(0.083)	(0.210)	(0.765)							
CAPITAL	0.133*	0.027	-0.144*	-0.167*	-0.208*	1.000					
	(0.000)	(0.356)	(0.000)	(0.000)	(0.000)						
LOANSHARE	0.197*	0.087*	-0.106*	-0.111*	-0.052	0.174*	1.000				
	(0.000)	(0.003)	(0.000)	(0.000)	(0.080)	(0.000)					
DEPOSITSHARE	0.146*	0.127*	-0.253*	-0.259*	-0.139*	-0.167*	0.372*	1.000			
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)				
GDP	-0.107*	0.118*	0.168*	0.057	0.285*	-0.182*	-0.223*	0.019	1.000		
	(0.005)	(0.000)	(0.000)	(0.053)	(0.000)	(0.000)	(0.000)	(0.527)			
INF	-0.215*	-0.028	0.056	0.088*	0.299*	-0.074*	-0.299*	-0.328*	0.219*	1.000	
	(0.000)	(0.349)	(0.057)	(0.003)	(0.000)	(0.013)	(0.000)	(0.000)	(0.000)		
GDPCAP	0.267*	0.009	0.352*	0.487*	-0.448*	0.099*	0.362*	0.105*	-0.313*	-0.490*	1.000
	(0.000)	(0.768)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	

*** p<0.01, ** p<0.05, * p<0.1

4. The Impact of Foreign Capital Flows on Banking Stability

4.1. Main Finding

To reach a clear answer, we employ multivariate regression analysis to examine the impact of each type of foreign capital flows after controlling bank-specific variables and country-level variables. Our main baseline model is constructed as follows:

$$Y_{i,t} = \alpha + \beta_1 FI_{n,t} + \beta_2 Macro_{n,t} + \beta_3 Bank_{i,t} + \varepsilon_{i,t,n} \qquad (1)$$

here, Y is the Zscore indicator that measures the stability of banks. The main explanatory variables (FI) include PINVEST, OINVEST and DINVEST. Macro is the set of

country-level control variables consisting of GDP, INF and GDPCAP. Bank is the set of bank-specific control variables including SIZE, CAPITAL, DEPOSITSHARE and LOANSHARE. $\varepsilon_{i,t,n}$ is the error term. Subscript i, t, n refer to bank, year and country respectively.

Our main findings are depicted in table 3, where we perform the ordinary least squares regression in all models. Because many studies concern the adverse effect of FPI flows, we start with only PINVEST variable in Model (1). The result shows that the coefficient on PINVEST is remarkably negative and statistically significant at the 10% level. It means that an increase in FPI flows makes banks face more the instability risk. In Model (2), we obtain all types of foreign capital flows. The evidence indicates that the effect of PINVEST in this model is similar to in Model (1). Besides, the impact of OINVEST on Zscore is significantly negative and stands at the 1% statistical significance level. By contrast, the coefficient on DINVEST is remarkably positive and has the 1% statistical significance level. It means that FDI flows contribute to enhance banking stability in recipient countries.

We add bank-specific and country-level control variables in Model (3) and Model (4) respectively. Again, the result of both PINEST and OINVEST still remains unchanged in which the coefficient on PINEST stands at the 5% and 1% statistical significance level in Model (3) and Model (4) respectively. Meanwhile, the coefficient on DINVEST is only positive and statistically significant in Model (3). In Model (5) – baseline model – we add both bank-specific and country-level control variables. The result shows that the adverse impact of both PINVEST and OINVEST on the stability of banks continues to maintain unaltered. For DINVEST, the coefficient is not statistically significant.

Overall, our regression results support the hypothesis H2 suggesting a significantly negative relationship between FPI and FOI flows and the stability of domestic banks. In addition, even though FDI flows has a positive association with the banking stability and thus supporting the hypothesis H1, but the result is less stable.

Table 3: Baseline Multivariate Analysis

The table below presents the empirical estimations of the relationship between foreign capital flows and banking stability from 2008 to 2019 in six ASEAN countries. We winsorize all variables at 1% and 99% levels. The asterisks ***, **, * denote significance at the 1%, 5%, and 10% level respectively.

VARIABLES	(1) Reduced model	(2) Different types of foreign capital flows	(3) Bank-specific control variables	(4) Country-level control variables	(5) Baseline model
PINVEST	-5.266*	-5.259*	-7.108**	-7.493***	-7.711***
	(3.085)	(2.957)	(2.826)	(2.843)	(2.853)
OINVEST		-10.53***	-9.218***	-9.605***	-9.203***
		(2.880)	(2.906)	(2.995)	(2.999)
DINVEST		7.468***	7.789***	0.0773	0.833
		(2.128)	(2.142)	(2.388)	(2.595)
SIZE			-0.0392**		0.0241
			(0.0175)		(0.0218)
CAPITAL			1.809*		1.425
			(0.989)		(0.975)
LOANSHARE			1.117***		0.175
			(0.413)		(0.455)
DEPOSITSHARE			1.180**		0.616
			(0.513)		(0.538)
GDP				4.653	4.592
				(3.168)	(3.237)
INF				-1.245	-0.549
				(1.595)	(1.714)
GDPCAP				0.606***	0.594***
				(0.0942)	(0.123)
Constant	4.658***	4.562***	3.676***	-0.377	-1.626
	(0.0574)	(0.0817)	(0.631)	(0.849)	(1.306)
Observations	683	683	682	683	682
R-squared	0.005	0.026	0.089	0.115	0.120

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

4.2. Robustness Tests

To conduct some robustness tests, we begin with using the ratio of loan loss reverses to total assets (LLR) as an alternative measure for Zscore. This ratio will reflect real loan losses expected and is also used in large body of financial literature (e.g. Tran & Lu, 2021). The higher LLR means that banks will face higher risk of instability. The result is described in panel A of table 4. We control bank-specific variables, country-level variables and all of them in Model (1), (2), (3) respectively. Generally, all coefficients on PINVEST are positive and statistically significant at the 1% level. It means that an increase in FPI flows leads banks to be more instability risk. This evidence is consistent with our previous finding. By contrast, all coefficients on DINVEST are negative and statistically significant at the 1% level. This result supports the view of the bright side of FDI flows. For FOI flows, all coefficients on OINVEST are statistically insignificance.

Because the economies in recipient countries will need a necessary period of time to absorb foreign capital flows. Therefore, in panel B of table 4, we re-perform our main findings in which all primary explanatory variables are lagged one year and Zscore is used as the dependent variable. The adverse impact of FPI flows on banking stability continues to be consistent with our previous finding. But, the coefficient of DINVEST appears negatively and statistical significance when we control macroeconomic conditions in Model (2) and perform our baseline model in Model (3). Meanwhile, the coefficients on OINVEST in all models are statistically insignificance.

In short, our findings advocate the linear relationship between the volatility of FPI flows and banking instability again. For other foreign capital flows, the results are less clear and even mixed compared to the previous findings.

Table 4: Alternative Measure and Robustness Tests

Two tables below describe the empirical results in which we use the loan loss reserve ratio (LLR) as the alternative measure for our dependent variable (Zscore) in Panel A and all primary explanatory variables are lagged one year in Panel B. We continue to winsorize all variables at 1% and 99% levels. The asterisks ***, **, * denote significance at the 1%, 5%, and 10% level respectively. The period spans from 2008 to 2019.

Panel A: Using LLR proxy as the alternative measure for Zscore

VARIABLES	(1) Bank-specific control variables	(2) Country-level control variables	(3) Baseline model
	Y=LLR		
PINVEST	0.0625***	0.0727***	0.0638***
	(0.0143)	(0.0144)	(0.0130)
OINVEST	-0.0177	0.0251	0.0306
	(0.0248)	(0.0278)	(0.0245)
DINVEST	-0.0519***	-0.163***	-0.0950***
	(0.0167)	(0.0251)	(0.0226)
SIZE	-0.000517***		-0.000486***
	(0.000137)		(0.000158)
CAPITAL	0.0650***		0.0663***
	(0.00911)		(0.00908)
LOANSHARE	0.0110***		0.00888**
	(0.00382)		(0.00425)
DEPOSITSHARE	-0.00479		0.0101**
	(0.00485)		(0.00490)
GDP		-0.186***	-0.165***
		(0.0245)	(0.0223)
INF		0.127***	0.127***
		(0.0152)	(0.0156)
GDPCAP		0.00614***	0.00215**
		(0.00113)	(0.00105)
Constant	0.00462	-0.0378***	-0.0194*
	(0.00557)	(0.00979)	(0.0108)
Observations	1,115	1,118	1,115
R-squared	0.105	0.122	0.173

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Panel B: All primary explanatory variables are lagged one year.

VARIABLES	(1) Bank-specific control variables	(2) Country-level control variables	(3) Baseline model
	Y=Zscore		
L.PINVEST	-6.861***	-8.720***	-9.730***
	(2.553)	(2.829)	(2.821)
L.OINVEST	-0.0373	0.101	0.284
	(2.717)	(2.949)	(2.948)
L.DINVEST	2.046	-5.860***	-5.243**
	(2.050)	(2.208)	(2.310)
SIZE	-0.0334*		0.0385*
	(0.0179)		(0.0215)
CAPITAL	2.056**		1.831*
	(1.019)		(1.007)
LOANSHARE	1.087***		0.104
	(0.418)		(0.450)
DEPOSITSHARE	1.339**		0.730
	(0.521)		(0.535)
GDP		5.033	5.661
		(3.506)	(3.589)
INF		-0.927	-0.0844
		(1.650)	(1.730)
GDPCAP		0.615***	0.652***
		(0.0980)	(0.126)
Constant	3.449***	-0.453	-2.550*
	(0.646)	(0.908)	(1.329)
Observations	682	683	682
R-squared	0.075	0.110	0.119

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

4.3. Alternative Econometric Approaches

To tackling potential issues such as unobserved bank-specific and time fixed-effects are not random, according to Phan et al. (2021), we approach the fixed-effects estimator as alternative econometric method. The results are depicted in panel A of table 5. We control bank-specific variables, country-level variables and all ones in Model (1), (2), (3) respectively. Overall, the negative effect of both FPI and FOI flows on Zscore indicator appears in all models and standing at the 1% statistical significance level. These results are consistent with our previously main findings. The results of FDI flows in panel A are similar to that in table 3. Accordingly, the coefficient on DINVEST is only positive and statistically significant when we control bank-specific variables.

In the final stage of robustness test, to eliminate endogeneity issues, following Arellano and Bond (1991); Blundell and Bond (1998), we use the dynamic system GMM for re-performing our main findings in which we respectively control bank-specific variables, country-level variables and all these ones in the panel B of table 5. Again, the empirical evidence shows the adverse impact of both FPI and FOI flows on the banking stability in all models. These results continue to be consistent with our main findings in table 3. The effect of FDI flows is also similar to our previous evidence described in table 3 and in panel A of table 5.

In brief, the findings in table 5 again advocate the hypothesis H2, while the result of FDI flows supporting the hypothesis H1 is still less pronounced.

Table 5: Alternative Econometric Approaches

Two tables below show the empirical result in which we approach the fixed-effects estimator and the dynamic panel of system GMM method in Panel A and Panel B respectively, to test further our previous finding. We also winsorize all variables at 1% and 99% levels. The asterisks ***, **, * denote significance at the 1%, 5%, and 10% level respectively. The period spans from 2008 to 2019.

Panel A: Approaching the fixed-effects estimator

VARIABLES	(1) Bank-specific control variables	(2) Country-level control variables	(3) Baseline model
PINVEST	-7.376***	-7.428***	-7.500***
	(2.290)	(2.554)	(2.463)
OINVEST	-9.299***	-9.685***	-9.341***
	(1.544)	(1.638)	(1.641)
DINVEST	8.188***	0.224	1.187
	(1.470)	(1.724)	(1.860)
SIZE	-0.0317*		0.0290
	(0.0183)		(0.0215)
CAPITAL	2.326**		1.818*
	(1.023)		(0.960)
LOANSHARE	1.095**		0.158
	(0.478)		(0.513)
DEPOSITSHARE	1.211**		0.625
	(0.514)		(0.512)
GDP		4.726	4.683
		(3.021)	(3.036)
INF		-1.244	-0.570
		(1.662)	(1.702)
GDPCAP		0.608***	0.601***
		(0.109)	(0.133)
Constant	3.417***	-0.409	-1.860
	(0.639)	(0.975)	(1.307)
Observations	682	683	682
R-squared	0.0889	0.1148	0.1197
Number of BANK	74	74	74

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Panel B: Approaching the GMM regression

VARIABLES	(1) Bank-specific control variables	(2) Country-level control variables	(3) Baseline model
L.ZSCORE	0.170	0.0363	0.0158
	(0.142)	(0.137)	(0.132)
PINVEST	-6.361*	-7.910**	-8.726***
	(3.372)	(3.517)	(3.266)
OINVEST	-10.75***	-12.16***	-11.95***
	(1.808)	(2.119)	(2.150)
DINVEST	7.889***	1.495	2.104
	(1.318)	(2.007)	(2.465)
SIZE	-0.0244		0.0379
	(0.0178)		(0.0250)
CAPITAL	2.215**		2.405**
	(0.974)		(0.979)
LOANSHARE	0.836		0.221
	(0.545)		(0.539)
DEPOSITSHARE	0.709		0.424
	(0.528)		(0.598)
GDP		6.432	8.533*
		(4.646)	(4.594)
INF		-1.072	-0.419
		(1.749)	(1.803)
GDPCAP		0.586***	0.618***
		(0.168)	(0.222)
L.LLR			
Constant	3.013***	-0.518	-2.478
	(0.854)	(1.381)	(2.039)
Wald chi2	12007.39	10204.87	11169.13
Prob > chi2	0.000	0.000	0.000
AR(2)	0.964	0.395	0.327
Observations	591	592	591
Number of BANK	71	71	71

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

5. The Role of International Trade Cooperation and Distribution

In this section, we assess the impact of the international trade cooperation and distribution on the main findings across all countries in our sample. To start, we divide these nations into two groups including: higher and lower trade openness. Accordingly, higher trade openness are countries having trade openness indicator above the median value and lower trade openness are the rest of nations. This indicator is collected from World Bank database. In each sub-sample, we continue to control bank-specific variables, country-level variables and all ones respectively and our results are described in table 6.

Overall, the results in countries having higher trade openness are consistent with our main findings. Meanwhile, in other countries, the effect of FDI flows on Zscore is significantly positive in all models and that of FPI and FOI flows is only statistical significance in the baseline model. Accordingly, FPI and FOI flows have the positive and negative effect respectively.

These results support hypothesis H3, which considers that the unexpected effect of the volatility of FPI and FOI flows on banking stability will be clearer in nations having higher trade openness. Additionally, FDI flows contribute to enhance the banking stability and this contribution is more pronounced in countries having lower trade openness.

Table 6: The Role of International Trade Cooperation and Distribution

The table below shows the empirical result according to the sample divided into two groups consisting of higher and lower trade openness based on the median value of trade openness indicator. We continue to winsorize all variables at 1% and 99% levels. The asterisks ***, **, * denote significance at the 1%, 5%, and 10% level respectively. The period spans from 2008 to 2019.

	(1)	(2)	(3)	(4)	(5)	(6)
	Higher trade openness			Lower trade openness		
VARIABLES	Bank-specific control variables	Country-level control variables	Baseline model	Bank-specific control variables	Country-level control variables	Baseline model
PINVEST	-8.862***	-7.987**	-7.262**	13.23	10.75	39.67***
	(3.108)	(3.097)	(3.095)	(11.74)	(11.68)	(13.63)
OINVEST	-8.565***	-8.427***	-8.018***	-14.73	-10.81	-35.93**
	(3.038)	(3.093)	(3.079)	(11.15)	(14.63)	(15.51)
DINVEST	6.028***	-0.196	-0.637	53.71***	41.81**	57.04***
	(2.252)	(2.472)	(2.851)	(13.43)	(16.07)	(16.24)
SIZE	-0.0744***		0.0458	-0.0872**		-0.150***
	(0.0273)		(0.0451)	(0.0422)		(0.0401)
CAPITAL	0.503		1.722	3.877		4.205*
	(1.634)		(1.638)	(2.429)		(2.266)
LOANSHARE	0.389		-0.0954	1.336		-1.745
	(0.575)		(0.574)	(1.067)		(1.072)
DEPOSITSHARE	2.082***		1.234*	-0.0239		1.779
	(0.694)		(0.741)	(1.748)		(1.505)
GDP		5.595	4.181		-4.988	-0.908
		(3.745)	(3.943)		(7.463)	(7.712)
INF		-3.186*	-1.478		0.862	4.060
		(1.731)	(1.905)		(5.529)	(5.533)
GDPCAP		0.524***	0.595***		1.419***	2.646***
		(0.0997)	(0.172)		(0.350)	(0.496)
Constant	4.616***	0.328	-2.280	4.009**	-7.532***	-15.78***
	(0.971)	(0.920)	(2.276)	(1.703)	(2.877)	(3.944)
Observations	491	491	491	191	192	191
R-squared	0.117	0.136	0.143	0.139	0.180	0.273

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

6. Conclusions

In the landscape of constantly increasing in size of gross cross-border capital flows into emerging countries, there are some concerns about their adverse impact on financial stability through transmission channel of banking system. Our study contributes to provide the empirical evidence to shed more light on this vital issue. The consistent evidence in this paper proves the unexpected influence of FPI flows on banking stability in ASEAN countries. At the same time, we find that FOI flows have a certain role in creating the instability of banks, but the evidence is less pronounced compared to FPI flows. In addition, to some extent, FDI flows support the stability of domestic banks, however the evidence is not stable in some stages of robustness tests. Furthermore, our regression results indicate that countries having higher trade openness may face the higher risk of banking instability coming from the volatility of both FPI and FOI flows. Therefore, we suggest that although further opening trade cooperation and international distribution to attract more foreign investments has been a necessary action in emerging countries, but regulators should carefully consider when creating policies-related to minimize the adverse impact of these foreign capital flows.

Generally, our study provides the empirical evidence to re-confirm some recent concerns about the negative effect of foreign capital flows, especially the volatility of FPI and FOI flows, on the banking system in developing countries. In this vein, our results may be seen as the additional findings to various related studies such as Banerjee, Devereux and Lombardo (2016); Bruno and Shin (2017); Furceri, Guichard and Rusticelli (2012). In addition, the empirical analysis also contributes to the recent findings of Nguyen (2022), who considers that governments in emerging nations should increase opening and interacting trade cooperation international distribution to attract more foreign investors. Our findings show that policy-makers should cautiously examine related policies when attracting the cross-border capital flows. At the same time, we believe that regulators in these countries should build different scenarios to deal with the sudden increase or decrease in international capital flows. This helps not only to provide a proactive position for governments, but also to enhance the smooth operation of banking system in particular and financial sector in general.

Although we have achieved some main purposes, there are still drawbacks that future studies could fill these gaps. For instance, there are certain differences in the level of regulation and business environment in each country (e.g., higher or lower level of corruption) and these factors may impact on our findings. Hence, we hope that our study will pay the way for many papers carried out to find out these issues in coming time.

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