

# Risk Transmission of Bank Foreign Subsidiary: Evidence from ASEAN Emerging Countries

Etikah Karyani<sup>1\*</sup>, Agusman<sup>2</sup>

<sup>1</sup>Sebelas Maret University, Surakarta, Indonesia

<sup>2</sup>OJK Board of Commissioners, Jakarta, Indonesia

E-mail: <sup>1</sup>[etikah.karyani@staff.uns.ac.id](mailto:etikah.karyani@staff.uns.ac.id), <sup>2</sup>[agusman@ojk.go.id](mailto:agusman@ojk.go.id)

<sup>\*</sup>Corresponding Author

---

## **JEL Classification:**

F30

G21

G32

*Received: 07 June 2023*

*Revised: 26 March 2024*

*Accepted: 29 March 2024*

*Available online: April 2024*

*Published regularly: April 2024*

## **Abstract**

**Research Originality:** To the best of our knowledge, this study is the first to investigate the impact of home country parent bank risks on destination country subsidiaries in an ASEAN setting. Moreover, this study adds to the previous literature by using the post-global financial crisis period in ASEAN countries, various types of risks, and dynamic panel data.

**Research Objectives:** This study aims to examine the association between parent and foreign subsidiary banks. The study also examines how bank regulation, national governance, and financial deepening in host countries affect the association.

**Research Methods:** This study uses dynamic panel data of 43 foreign banks operating in ASEAN emerging countries during the period 2010-2018.

**Empirical Results:** The findings indicate a significantly positive association between parent and subsidiary bank risk, particularly for credit and liquidity risks. National governance and bank regulation mitigate the risk transmission. In contrast, financial deepening amplifies the transmission of risks between parent and subsidiary banks.

**Implications:** This finding has important implications, in terms of policy interventions and regulatory mechanisms that national governments can deploy to lower risk exposure of subsidiary banks, while at the same time encouraging foreign investments into the financial services sectors in ASEAN countries.

## **Keywords:**

international banking; risk transmission; bank regulation; national governance; financial deepening

---

## **How to Cite:**

Karyani, E., & Agusman. (2024). Risk Transmission of Foreign Subsidiary: Evidence from ASEAN Emerging Countries. *Etikonomi*, 23(1), 129 – 146. <https://doi.org/10.15408/etk.v23i1.32703>.

<sup>\*</sup>The views expressed in this paper are those of the authors and do not necessarily reflect the opinions of the Indonesian Financial Service Authority (OJK).

Copyright © 2024 by Authors.

This is an open-access article under CC BY-SA license (<https://creativecommons.org/licenses/by-sa/4.0>)

## **INTRODUCTION**

Globalization has encouraged a number of banks to have bank subsidiaries abroad. Therefore, it is interesting to know whether the risk from parent banks can be transmitted to their subsidiaries in other countries, and what factors affect such transmission. This is an important issue because by understanding the factors, the host countries can introduce a relevant policy response to protect their banking system.

Previous studies by Anginer et al. (2017) and Perić et al. (2018) provide an important insight on this issue. They argue that a positive and significant association indicates the risk is transmitted between parent banks and their subsidiaries abroad. This condition is because there is a system for the internal capital market, which allows global banks to channel capital and liquidity in all operating locations, called the internal market (Cerutti et al., 2017). Although several earlier studies have explored the link between the parent company and its affiliates (see Anginer et al., 2017; Perić et al., 2018), the analysis is still debatable as to the extent to which where the influence and significance (Anginer et al., 2017).

Therefore, this study examines the association between parent and subsidiary bank risk from 43 foreign subsidiary banks operating in ASEAN emerging countries between 2010 and 2018. In addition, this study examines how bank regulation, national governance, and financial deepening in host countries affect the relationship. Our study is the first study investigating the risk effects of a parent bank in a home country on subsidiaries in a host country with an ASEAN background. Meanwhile, ASEAN banks are worth studying because, after the 1997/1998 crisis and the subsequent global financial crisis, a significant banking restructuring program has been implemented, leading to a better banking system. Awareness of governance issues has generally improved. Moreover, lately, several countries in ASEAN have encouraged a financial deepening program to strengthen the role of the financial sector in their economy (ASEAN, 2023). Taken together, these developments provide a window of opportunity to explore the effect of these factors on the relationship between a parent bank and its subsidiary bank risks.

The current study adds to the literature in several ways. First, as stated earlier, our study evaluates the effectiveness of the banking restructuring program in the post-global financial crisis period in ASEAN countries. These countries have made significant progress since the financial crisis by strengthening their macroeconomic frameworks and external positions. ASEAN financial integration has also progressed, so cross-border banking relations have deepened (Almekinders et al., 2015). However, financial integration also has potential risks for the banking industry if implemented without sufficient regulatory structure (Wihardja, 2015).

Secondly, we include the financial deepening as a new moderating variable. While the role of bank regulation and governance has been well documented in previous studies (see Anginer et al., 2017), fewer studies have explored the impact of financial deepening. This fact represents an important gap in knowledge, as financial deepening has a potentially significant impact on risk-taking behavior (see Nwosu. et al., 2021;

Arcand et al., 2015; Sahay et al., 2015). Thirdly, we employ a more comprehensive risk type, including total, credit, and liquidity risks. This condition will add to our knowledge since different risk types may respond differently, leading to a different policy response. It is heavily affected by bank management decisions, as bank financial reports indicate. Previous studies identified total risk using accounting ratios that are more explanatory than specific risk (such as market risk). This proxy covers risks specific to each bank and market risks or risks affecting the whole banking industry (Agusman et al., 2008; Qureshi & Lamarque, 2023).

Fourthly, our study employs a better model, which is dynamic panel data. For comparison, Anginer et al. (2017) only use static panel data. The advantage of the dynamic data model, proposed by Arellano & Bond (1991) and developed by Arellano & Bover (1995), and Blundell & Bond (1998), is that it can get around the issue of endogeneity in independent variables. It uses instrumental variables generated by lagged variables (simultaneity bias problem of inverse causality and omitted variables).

Our study uncovers significant findings. As the risk of overseas parent banks rises, so does the risk of subsidiary banks, a relationship that remains robust even after rigorous testing. We also found that financial market depth in the parent bank country amplifies the effect of parent risk on its subsidiaries in the host country. Moreover, strict regulation of bank capital in both the home and host country and national governance are crucial in reducing risk transmission. These findings underscore the importance of policy and regulatory interventions in mitigating the effects of bank failures, offering valuable insights for policymakers and banking practitioners.

The rest of this paper is organized as follows. The hypotheses are developed in Section 2 after a survey of the literature. In Section 3, the data and technique are described after this. The empirical findings are then presented and discussed in Section 4. Section 5 of the study includes a summary of the main conclusions and highlights of the policy implications.

## **METHODS**

This study uses year-end bank-level financial and ownership data for parent and subsidiary banks from 2010 to 2018. This period is a normal period, excluding the period of the global financial crisis of 2008-2009 and the latest data (after the year 2018) to avoid bias from the effect of the COVID-19 Pandemic Period (abnormal period). The COVID-19 pandemic has caused a severe global recession with different impacts within and across countries. The COVID crisis started in the fourth quarter of 2019 and ended after the end of 2022.

We focus on foreign subsidiary banks operating in five countries in ASEAN, namely Indonesia, Malaysia, Philippines, Thailand, and Vietnam. Initially, we want to include all ASEAN countries. However, data availability ultimately leads us to examine only the five countries listed above. This data was from BankScope-Bureau van Dijk. For incomplete observations, whenever appropriate, we include the data from the relevant banking

authorities and the sample banks' websites. We obtained a sample of 43 foreign banks operating in these countries based on the data availability. These banks are subsidiaries of 28 parent banks from 14 home countries..

A dynamic panel data model is employed because bank risk generally has a dynamic phenomenon in which the previous value of the risk affects its current value (see Perić et al., 2018). To more accurately estimate the dynamic relationship between dependent and independent variables, we use a two-step Generalized Method of Moments (GMM) estimator based on Arellano and Bond (1991).

Next, we perform some specification tests to check the validity of the GMM estimator. These include the Wald statistic for testing the joint significance of dependent variables, the Arellano-Bond test for the autocorrelation of first-order differential errors is zero, and the J test for overidentifying constraints. The GMM estimator is consistent if there is no second-order serial correlation between the error terms of the first-order differential equation and if the J-statistic is insignificant.

Furthermore, this study did not perform an endogeneity test because the possibility of reverse causality was small for several reasons. First, it is following the observations of the sample of this study and previous studies that most of the foreign banks in ASEAN-5 are owned by the parent bank (around 50%) so subsidiary banks are very much controlled by the parent bank. Changes in the risk of subsidiary banks are also not influenced by changes in the risk of the parent bank (see the study of Perick et al., 2018). Second, since it is almost impossible to statistically guarantee a complete resolution of the endogeneity problem, it is an option to overcome this (Ketokivi & McIntosh, 2017; Roberts & Whited, 2013). Third, GMM testing can reduce specification errors that might interfere with regression, such as heteroscedasticity and nonlinearity (Roberts & Whited, 2013).

The dependent variables are the risk measures of the subsidiary banks. As in Agusman et al. (2008; 2014), we use several accounting risk measures. These include the standard deviation of pre-tax return on assets estimated using a three-year moving window of annual observations (SDROAS), a proxy for total risk; non-performing loan ratio (NPLS), a proxy for credit risk; and Liquid-assets-total-assets-ratio (LIQATAS), a proxy for liquidity risk. The main independent variable is parent bank risk. The same approach is implemented for calculating the risk measure to the subsidiary banks but using the parent banks' data. Hence, we have SDROAP, NPLP, and LIQATAP as a proxy for the parent banks' total, credit, and liquidity risks. Following Anginer et al. (2017), a positive and significant relation between the risk measures of the parent banks and the risk measures of the subsidiary banks (SDROAP and SDROAS; NPLP and NPLS; and LIQATAP and LIQATAS, respectively) suggests the presence of the risk transmission.

Moreover, we use three moderating variables: bank regulation, national governance, and financial deepening of the host countries. Regarding bank regulation, we use the capital adequacy ratio of the subsidiary banks (CAPREG) as a proxy because, as stated

earlier, capital regulation is one of the most important bank regulations. However, without the capital-adequacy-ratio data, we use the ratio of capital to assets. National governance refers to the World Governance Index (WGI) issued by the World Bank. From the six measures of different dimensions of national governance, we use the Control of Corruption (CONCOR) measure as a proxy for national governance because corruption is a pervasive issue in ASEAN countries, hence, it is very important to control it. Then, following the World Bank, financial deepening is proxied by the ratio of Private Sector Credit to Gross Domestic Products (PSCGDP). We chose this ratio because, as the World Bank and Sahay et al. (2015) indicated, it has received much attention in the empirical literature.

Financial deepening generally refers to the depth and efficiency of a country's financial system. The depth can be measured in terms of the size of the banks or the stock market as a percentage of GDP (Ho et al., 2018). The efficiency is harder to measure directly, but the following conditions can be used to assess the level of financial deepening in a country. First, sectors and agents have access to a variety of financial markets for making investment and savings decisions, particularly those involving long maturities (access). Second, financial markets and intermediaries can handle more capital deployment and turnover without requiring significant equivalent changes in asset prices (market liquidity). Third, through hedging or diversification, the financial sector can provide a wide range of assets for risk-sharing objectives (Goyal et al., 2011).

We also capture control variables for bank size (SIZE) and general macroeconomic conditions (GDPGR) in the host countries. Previous studies have shown mixed results regarding the relationship between bank size and bank risk. According to Barra & Ruggiero (2023), bank size does not affect bank credit risk because bank credit policies were more prudent during and after the financial crisis and after the introduction of Basel regulations. However, the presence of a policy that is too big to fail will result in a positive relationship. Nguyen (2015) argues that banks with more diversified assets will enjoy higher persistent profits, thereby reducing their risk. Therefore, the relationship between bank size and risk-taking shows inconclusive results, while this study does not expect a specific sign for SIZE.

Furthermore, this study uses the Gross Domestic Product growth rate (GDPGR) to control prevailing macroeconomic conditions. ASEAN countries generally faced volatile economic conditions during the study period. In addition, compared to the inflation rate, GDPGR is the most determinant of credit risk in the host country (see Perić et al., 2018). However, it is important to note, that our study does not include a control variable for parent banks' financial characteristics and home-country macroeconomic conditions. This is because our study focuses more on a host country's point of view. We do not include variables that cannot be controlled by policy responses from the host countries.

SDROAS is the standard deviation of the pretax-return-on-assets estimated in a three-year moving window of annual observations, a proxy for the total risk of the subsidiary banks. NPLS is the non-performing loans ratio, a proxy for the credit risk

of the subsidiary banks. LIQATAS is the liquid-assets-to-total-assets-ratio, a proxy for the liquidity risk of the subsidiary banks. SDROAP is the standard deviation of the pretax-return-on-assets estimated in a three-year moving window of annual observations, a proxy for the total risk of the parent banks. NPLP is the non-performing loans ratio, a proxy for the credit risk of the parent banks. LIQATAP is the liquid assets to total assets ratio, a proxy for the liquidity risk of the parent banks. CAPREG is the capital adequacy ratio, a proxy for bank regulation of the host countries. CONCOR is the control of the corruption index, a proxy for the national governance of the host countries. PSCGDP is the private-credits-to-GDP-ratio, a proxy for the financial deepening of the host countries. SIZE is total assets (in USD billion), a proxy for the size of the subsidiary banks. GDPGR is the growth rate in GDP, a proxy for the general macroeconomic conditions of the host countries. All variables are transformed using the natural logarithmic transformation. Thus, based on the discussions on the dependent and independent variables, we specify the following three general models:

$$SDROAS_{i,t} = \alpha_0 + \alpha_1 SDROAS_{i,t-1} + \alpha_2 SDROAP_{i,t-1} + \alpha_3 CAPREG_{i,t-1} + \alpha_4 CONCOR_{i,t-1} + \alpha_5 PSCGDP_{i,t-1} + \alpha_6 SIZE_{i,t-1} + \alpha_7 GDPGR_{i,t-1} + error_{i,t-1} \quad (1)$$

$$NPLS_{i,t} = \alpha_0 + \alpha_1 NPLS_{i,t-1} + \alpha_2 NPLP_{i,t-1} + \alpha_3 CAPREG_{i,t-1} + \alpha_4 CONCOR_{i,t-1} + \alpha_5 PSCGDP_{i,t-1} + \alpha_6 SIZE_{i,t-1} + \alpha_7 GDPGR_{i,t-1} + error_{i,t-1} \quad (2)$$

$$LIQATAS_{i,t} = \alpha_0 + \alpha_1 LIQATAS_{i,t-1} + \alpha_2 LIQATAP_{i,t-1} + \alpha_3 CAPREG_{i,t-1} + \alpha_4 CONCOR_{i,t-1} + \alpha_5 PSCGDP_{i,t-1} + \alpha_6 SIZE_{i,t-1} + \alpha_7 GDPGR_{i,t-1} + error_{i,t-1} \quad (3)$$

To examine the impact of banking regulation, national governance, and financial deepening on the extent of the risk transmission, we interact the moderating variables (CAPREG, CONCOR, or PSCGDP) with the parent banks' risk variables (SDROAP, NPLP, or LIQATAP), respectively. A negative and significant sign for the interaction between SDROAP or NPLP and the moderating variables, or a positive and significant sign between LIQATAP and the moderating variables indicates that the moderating variables are effective in dampening the risk transmission from the parent banks.

## RESULT AND DISCUSSION

Table 1 reports descriptive statistics of the raw variables. The dependent variable (the risk measures of subsidiary banks) of SDROAS has a mean (median) of 0.58% (0.33%); NPLS has a mean (median) of 2.17% (1.74%); and LIQATAS has a mean (median) of 31.03% (27.70%). The independent variable (the risk measures of parent banks) of SDROAP has a mean (median) of 0.14% (0.09%); NPLP has a mean (median) of 2.11% (1.54%); and LIQATAP has a mean (median) of 20.68% (20.60%). These statistics suggest that, in our sample, subsidiary banks generally have a higher risk than parent banks.

The moderating variables, CAPREG has a mean (median) of 16.67% (13.80%), and CONCOR has a mean (median) of 45.56% (44.08%). Moreover, PSCGDP has

a mean (median) of 43.08% (25.40%). This result indicates that, on average, financial deepening in the countries in our sample remains very low or still in the initial stages. The lowest and the highest financial deepening is in Indonesia (11.00% in 2009) and Malaysia (83.60% in 2013), respectively. Nevertheless, after examining the effects of outliers, the skewness values of the dependent and independent variables show that our data have a highly skewed distribution. To achieve normality, variables should be transformed with the natural logarithm transformation before being used in our analyses. Table 2 shows the Pearson correlation coefficients during the study period. As expected, we find a positive and significant correlation between the dependent variable of SDROAS and the independent variable of SDROAP.

However, the correlations between NPLS and NPLP, and between LIQATAS and LIQATAP are not significant. While the results have indicated a transmission of total risk from parent banks to their subsidiary banks abroad, we need to study the presence of the risk transmission further using a more convincing approach (i.e., dynamic panel data methodology). The correlations among the independent, moderating, and control variables appear in the lower rows of Table 2. We find not all correlations are statistically significant. However, two correlations (between CONCOR and PSCGDP, and between CAPREG and SIZE) are high and significant. To ensure that these correlations will not lead to multicollinearity, we perform the variance inflation test (VIF). The VIF is below 10, indicating that multicollinearity is not a serious problem.

**Table 1. Descriptive Statistics**

<b>Variables</b>	<b>Mean</b>	<b>Median</b>	<b>Std.Dev.</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Skewness</b>	<b>N</b>
SDROAS	0.576	0.330	0.915	0.020	7.300	4.283	415
NPLS	2.169	1.740	1.881	0.000	15.820	1.833	430
LIQATAS	0.310	0.277	0.151	0.074	0.875	1.313	411
SDROAP	0.140	0.090	0.142	0.020	1.030	2.491	430
NPLP	2.109	1.540	1.653	0.200	9.220	1.762	428
LIQATAP	0.207	0.206	0.082	0.056	0.423	0.302	430
CAPREG	16.669	13.800	9.350	8.100	69.200	3.194	412
CONCOR	45.564	44.080	14.428	21.050	67.300	-0.025	430
PSCGDP	43.077	25.400	31.671	11.000	83.600	0.224	430
SIZE (USD billion)	5,312	2,394	6,560	7,000	27,709	1.756	415
GDPGR	5.000	5.170	1.793	-1.510	7.630	-2.156	430

Source: Data processing

Notes: The table reports the descriptive statistics of all variables in this study. SDROAS is a total risk of the subsidiary banks, NPLS is a non-performing-loans-ratio of the subsidiary banks, LIQATAS is a loans-to-deposits-ratio of the subsidiary banks, SDROAP is a total risk of the parent banks, NPLP is a non-performing-loans-ratio of the parent banks, LIQATAP is a loans-to-deposits-ratio of the parent banks. CAPREG is the capital adequacy ratio of the host countries. CONCOR is a national governance of the host countries, PSCGDP is a financial deepening of the host countries, SIZE is a total asset of the subsidiary banks, and GDPGR is a growth rate in GDP of the host countries.

Table 2. Correlation matrix

Variables	A	B	C	D	E	F	G	H	I	J	K	L	M	N
A SDROAS	1	0.680***	0.165***	0.123**	0.294***	0.272***	0.123**	0.024	-0.180***	0.296***	-0.080	-0.223***	0.336***	0.060
B SDROAS <sub>(t-1)</sub>		1	0.098*	0.126**	0.251***	0.253***	0.082	0.041	-0.183***	0.291***	-0.054	-0.174***	0.312***	0.073
C NPLS			1	0.834***	-0.266***	-0.314***	0.053	0.008	-0.152***	0.005	-0.242***	-0.262***	-0.010	-0.144***
D NPLS <sub>(t-1)</sub>				1	-0.236***	-0.289***	0.098*	0.013	-0.181***	0.040	-0.246***	-0.251***	-0.018	-0.100*
E LIQATAS					1	0.821***	0.160***	0.028	0.020	0.230***	0.091*	0.047	-0.449***	0.192***
F LIQATAS <sub>(t-1)</sub>						1	0.165***	0.038	0.045	0.244***	0.106**	0.078	-0.443***	0.183***
G SDROAP <sub>(t-1)</sub>							1	0.169***	-0.016	0.096*	-0.028	0.015	-0.092*	0.035
H NPLP <sub>(t-1)</sub>								1	0.200***	-0.120**	-0.043	0.039	0.119**	0.035
I LIQATAP <sub>(t-1)</sub>									1	-0.076	0.405***	0.446***	0.246***	-0.066
J CAPREG <sub>(t-1)</sub>										1	0.066	0.013	-0.536***	0.043
K CONCOR <sub>(t-1)</sub>											1	0.853***	0.226***	-0.016
L PSCGDP <sub>(t-1)</sub>												1	0.238***	-0.135***
M SIZE <sub>(t-1)</sub>													1	-0.109**
N GDPGR <sub>It-1</sub>														1

Source: Data processing

Note: The table reports the correlation matrix among variables in this study. The correlation is \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels, respectively. SDROAS is a total risk of the subsidiary banks, NPLS is a non-performing-loans-ratio of the subsidiary banks, LIQATAS is a loans-to-deposits-ratio of the subsidiary banks, SDROAP is a total risk of the parent banks, NPLP is a non-performing-loans-ratio of the parent banks, LIQATAP is a loans-to-deposits-ratio of the parent banks, CAPREG is the capital adequacy ratio of the host countries, CONCOR is a national governance of the host countries, PSCGDP is a financial deepening of the host countries, SIZE is a total asset of the subsidiary banks, and GDPGR is a growth rate in GDP of the host countries.



**Table 3. The relationship between parent and subsidiary bank risk**

Dependent variable:		SDROAS	NPLS	LIQATAS
Independent variables:	Expected signs:			
SDROAS <sub>(t-1)</sub>		0.462*** (0.042)		
NPLS <sub>(t-1)</sub>			0.381*** (0.020)	
LIQATAS <sub>(t-1)</sub>				0.309*** (0.029)
SDROAP <sub>(t-1)+</sub>	+	3.498*** (0.970)		
NPLP <sub>(t-1)</sub>	+		3.864*** (1.138)	
LIQATAP <sub>(t-1)</sub>	-			-3.230*** (0.755)
CAPREG <sub>(t-1)</sub>		-0.986** (0.433)	-0.867* (0.505)	0.740*** (0.120)
CONCOR <sub>(t-1)</sub>		-6.075*** (1.484)	-4.865*** (1.149)	1.829*** (0.276)
PSCGDP <sub>(t-1)</sub>		3.700*** (0.700)	2.706*** (0.545)	-1.536*** (0.304)
CAPREG <sub>(t-1)</sub> * SDROAP	-	-0.170*** (0.067)		
CONCOR <sub>(t-1)</sub> * SDROAP <sub>(t-1)</sub>			-0.895*** (0.223)	
PSCGDP <sub>(t-1)</sub> * SDROAP <sub>(t-1)</sub>				-0.328*** (0.081)
CAPREG <sub>(t-1)</sub> * NPLP <sub>(t-1)</sub>	-	-0.214* (0.111)		
CONCOR <sub>(t-1)</sub> * NPLP <sub>(t-1)</sub>			-1.001*** (0.258)	
PSCGDP <sub>(t-1)</sub> * NPLP <sub>(t-1)</sub>	-			0.445*** (0.118)
CAPREG <sub>(t-1)</sub> * LIQATAP <sub>(t-1)</sub>	+	0.368*** (0.074)		
CONCOR <sub>(t-1)</sub> * LIQATAP <sub>(t-1)</sub>	+		0.894*** (0.178)	
PSCGDP <sub>(t-1)</sub> * LIQATAP <sub>(t-1)</sub>	+			-0.448*** (0.101)
SIZE		-0.301*** (0.069)	0.104 (0.073)	-0.068*** (0.014)
GDPGR		-0.454*** (0.107)	-0.262*** (0.060)	0.038* (0.020)
Wald test (p-value)		0.000	0.000	0.000
J test (p-value)		0.577	0.260	0.384
Arellano–Bond test for AR(1) (p-value)		0.024	0.001	0.023
Arellano–Bond test for AR(2) (p-value)		0.354	0.330	0.186
N		309	287	307

Source: Data processing

Notes:

The table reports the correlations between parent and subsidiary bank risk in this study. The correlation is \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels, respectively. SDROAS is a total risk of the subsidiary banks, NPLS is a non-performing-loans-ratio of the subsidiary banks, LIQATAS is a loans-to-deposits-ratio of the subsidiary banks, SDROAP is a total risk of the parent banks, NPLP is a non-performing-loans-ratio of the parent banks, LIQATAP is a loans-to-deposits-ratio of the parent banks. CAPREG is the capital adequacy ratio of the host countries. CONCOR is a national governance of the host countries, PSCGDP is a financial deepening of the host countries, SIZE is a total asset of the subsidiary banks, and GDPGR is a growth rate in GDP of the host countries.

We test our hypotheses by employing the System GMM estimator. Three models are examined: the SDROAS, NPLS, and LIQATAS models. All models satisfy the requirement of the GMM, including the Wald test, the J-test, and the Arellano Bond test for zero autocorrelation in first-differenced errors. The regression results are reported in Table 3. We discuss the relation between each of the variables and each of the subsidiary bank risk measures. Table 3 shows that parent bank risk proxied by total risk (SDROAP), credit risk (NPLP), and liquidity risk (LIQATAP) significantly affect subsidiary bank risk with different signs. Thus, there is a correlation between the management of subsidiaries and parent companies that encourages risk transfer to achieve organizational goals.

Following the results of Schnabl (2012), the global interbank lending channel propagates liquidity shocks. Globally borrowing banks and foreign-owned banks are more affected by this channel than domestically funded institutions. In addition, liquidity crises in developed countries spread to developing countries through foreign banks in those countries. Furthermore, Cao et al. (2018) show that bank subsidiaries of parent banks in Greece, Ireland, Italy, Portugal, and Spain (GIIPS) have transmitted liquidity shocks that GIIPS countries have to deal with. In addition to liquidity risk, Perić et al. (2018) find that credit risk has a favorable impact on subsidiary credit risk.

Following the results of Schnabl (2012), the global interbank lending channel propagates liquidity shocks. Globally, borrowing banks and foreign-owned banks are more affected by this channel than domestically funded institutions. In addition, liquidity crises in developed countries spread to developing countries through foreign banks in those countries. Furthermore, Cao et al. (2018) show that bank subsidiaries of parent banks in Greece, Ireland, Italy, Portugal, and Spain (GIIPS) have transmitted liquidity shocks that GIIPS countries have to deal with. In addition to liquidity risk, Peri et al. (2018) find that credit risk has a favorable impact on subsidiary credit risk.

Similarly, Anginer et al. (2017) using fixed-effects panel data conclude that there is a strong and positive relationship between parent and foreign subsidiary default risk after correcting for regional differences in regulation. Overall, previous studies suggest that risks from parent banks can be transmitted to overseas subsidiaries. A significant relationship between the two indicates the existence of such risk transmission. This relationship can be driven by agency problems, the various incentives faced by individuals (or stakeholders) generate costs to align all agents' actions towards a common goal. Complex banks operating in different regions may not be able to efficiently control their subsidiaries. This may incentivize for local managers to take more risks (Kurowski & Gajewski, 2021).

CAPREG has an inconsistent result. It has a positive and significant impact on SDROAS, but a negative and significant impact on NPLS. This suggests that while bank regulation effectively reduces credit risk, it encourages banks to take a higher total risk. Hence, our findings are similar to previous studies that report an ambiguous impact of capital regulation on bank risk.

Capital regulation has a significant influence on foreign bank risk. Research has found that the relationship between capital regulation and bank risk-taking is complex. Initially, as capital ratios increase, banks tend to take less risk. However, after a certain point, higher capital requirements encourage risk-taking at a higher level. Stricter capital regulations may even increase the probability of bank default. Overall, capital regulation plays an important role in shaping foreign bank risk, with positive and negative impacts that depend on the specific conditions and regulatory environment (Dias, 2021; Morales, et al. 2022; Abou-El-Sood, et al. 2023).

Moreover, the national governance of the host countries (CONCOR) consistently has a negative and significant relation with the risk measures, suggesting that national governance is effective in reducing bank risk. Therefore, we can rely on national governance to mitigate total risk, liquidity risk, and credit risk. As stated by Otero et al. (2020), corporate governance can be replaced with a global framework at the company level. Moreover, previous studies investigate how country-level governance mechanisms (such as political power, low violence/terrorism, corruption control, and the rule of law) encourage the level of risk disclosure and bank performance (see Karyani et al. 2020; 2021). Country-level governance in terms of the rule of law and the quality of its enforcement is critical to developing its financial markets and possibly enhancing investor protection. In countries where the government provides comprehensive regulation of investor protection, investors are willing to provide capital to banks, increasing liquidity and the market value of capital. Subsidiaries in countries with stricter regulations will less impact domestic systemic risk (Yan, 2022; Frame et al., 2020).

However, the study of Chen & Hsu (2022) shows different results, such as the quality of national regulations reinforces the negative impact of capital ownership on bank risk in Asia. This result suggests that Asian developing-country banks favorably see enhancements to excellent national governance as having increased the value of their put options, thereby increasing their portfolio risk. Using a panel data model with a multilevel mixed effect, Chen & Hsu (2022) found that Asian foreign banks show higher profitability than domestic banks. This condition is influenced by the host's national governance, such as voice and accountability, political stability, and absence of violence/terrorism. Besides that, government effectiveness, regulatory quality, rule of law, and corruption control also impact the banks' profitability. Other scholars have cautioned that national governance mechanisms are not inherently a positive factor, especially in developing countries where powerful elites can circumvent institutions and thereby influence or determine the rules of the game (Nakpodia & Adegbite, 2018).

In contrast, the host country's financial deepening (PSCGDP) consistently has a positive and significant relationship with risk measures, indicating that financial deepening makes banks take on more risk in ASEAN foreign banks. According to Goyal et al. (2011), financial deepening in ASEAN countries is still early. It has yet to capitalize on its benefits in terms of facilitating better risk management practices.

Financial deepening encourages higher risk-taking and leverage, especially when the financial sector is less regulated and supervised (Sahay et al., 2015; Hamid et al., 2020). Financial depth also increases risk-taking through credit constraints faced by bank customers (Arcand et al., 2015; Chen & Hsu, 2022). Rapid credit expansion raises concerns about the quality of banks' loan portfolios or inadequate credit quality standards.

We continue our analysis with the impact of the moderating variables (CAPREG, CONCOR, or PSCGDP) on the relation between parent and subsidiary bank risk (Table 3). We focus on the signs of the interaction terms between each of the moderating variables and the risk measures of parent banks (SDROAP, NPLP, or LIQATAP), respectively. Regarding bank regulation, surprisingly, we find a negative and significant sign for the interaction terms of CAPREG\*SDROAP and CAPREG\*NPLP. Banking regulation has also reduced the positive relationship between parent and subsidiary bank risk (Anginer et al., 2017). This finding is supported by Borsuk et al. (2022), who states that the effect of regulation is greater on bank credit performance across countries in Ethiopia when there is a banking crisis in the host country. This result indicates that bank regulation effectively dampens the relationship between parent and subsidiary bank risks (total and credit risks). In other words, the host government can establish a solid risk management framework with regulatory measures and supervisory systems to oversee economic, political, and financial risks in the banking industry (Athari et al., 2023).

Otherwise, there is a positive and significant sign for the interaction term of CAPREG\*LIQATAP. The liquidity risk of foreign subsidiary banks is high when creditors simultaneously withdraw capital or foreign banks optimize their business by shifting most of their cash to profitable assets. Meanwhile, the host government tightens capital regulations, so banks must find other sources of capital through liquidity transmission between relationship banks to meet customer withdrawal needs, resulting in increased risk (Duy Suu et al., 2023).

There is a negative sign for the interaction terms CONCOR\*SDROAP and CONCOR\*NPLP and a positive value for the interaction term of CONCOR\*LIQATAP. These suggest that national governance also effectively reduces the relation between parent and subsidiary bank risk for total risk and credit risk. However, different domestic regulatory standards may lead to disparities in the cost and availability of funding, thereby increasing the risk of liquidity shortages for foreign banks. Similar to the findings of Dat & Nguyen (2023), the positive relationship between national governance and liquidity risk is due to the quality of national governance, which can mitigate information asymmetry and make banks strive in risk management. In contrast, we find a positive and significant value for the interaction terms PSCGDP\*SDROAP and PSCGDP\*NPLP, and a negative and significant value for the interaction term PSCGDP\*LIQATAP. These suggest that financial deepening exacerbates risk transmission between parent and subsidiary banks.

Finally, we explore the impact of the two control variables: bank size (SIZE) and country growth rate (GDPGR). In general, we find inconsistent results, as reported in previous studies. As shown in Table 3, SIZE has a negative and significant relation with total risk and liquidity risk but a positive and insignificant relation with credit risks. Consistent with the economies of scale and scope hypothesis, larger banks benefit from greater scale, capital, and coverage, which tend to diversify rather than take risks, indicating larger banks will be more stable (AlZoubi et al., 2022). In contrast, small banks face higher costs for non-deposit financing and cannot finance liquidity shocks at costs below a certain threshold, thus increasing their liquidity risk (Naqvi & Pungaliya, 2023). However, the relationship between bank size and credit risk is complex. The bank size does not directly affect credit risk. However, the bank size can indirectly influence credit risk through its impact on diversification, leverage, and the types of loans it can offer. Williams (2014) finds that in developing nations, increased size interacts with improved national governance to increase bank risk.

Moreover, GDPGR shows a negative and significant relationship between total and credit risks. However, the impact of GDPGR on liquidity risk is insignificant. This result proves that there is no clear relationship obtained from the relationship between GDPGR in the host country and multinational bank risk. The pessimistic estimate for GDP growth suggests that total risk and credit risk are higher in countries with lower GDP growth because higher GDP growth rates lead to increased economic activity and higher loan demand, potentially reducing default risk for foreign banks. In addition, higher GDP growth rates can lead to a decrease in inflation, which can help stabilize the host country's currency and reduce exchange rate volatility, thereby reducing default risk for foreign banks (Athari et al., 2023).

For robustness checks, we employ different risk measures, namely the loans-loss-provisions-to-total-loans-ratio (LLPS) to replace NPLS, and the loans-to-deposits-ratio (LDRS) to replace LIQATAS. Moreover, we use the Rule of Law index (ROLAW) to replace CONCOR as a proxy for national governance. In addition, we use the ratio of Stock Market Capitalization to GDP (SMCGDP) to replace PSCGDP as a proxy for financial deepening. The results are qualitatively similar to our previous analyses, particularly for the credit and liquidity risk models (see Table 5). Please note that it is difficult to claim that our result is robust concerning the total risk model. This condition is because we cannot provide an appropriate alternative for SDROAS.

Referring to Agusman et al. (2008), the best alternative for SDROA would be the total return risk (the standard deviation of the banks' stock returns). Since not all banks in our sample are listed in the capital markets, we cannot pursue a robustness check using the total return risk data. Overall, our results suggest the presence of international risk transmission between parent and subsidiary banks, particularly for credit and liquidity risks. Further studies may investigate this issue in the context of total risk.

**Table 4. The Relation Between Parent and Subsidiary Bank Risk (robustness tests)**

Dependent variable:		SDROAS	LLPS	LDRS
Independent variables:	Expected signs:			
SDROAS <sub>(t-1)</sub>		0.282*** (0.076)		
LLPS <sub>(t-1)</sub>			0.368*** (0.016)	
LDRS <sub>(t-1)</sub>				0.378*** (0.014)
SDROAP <sub>(t-1)</sub>	+	6.103** (2.918)		
LLPP <sub>(t-1)</sub>	+		6.292*** (1.094)	
LDRP <sub>(t-1)</sub>	+			6.835*** (0.658)
CAPREG <sub>(t-1)</sub>		-3.112*** (0.812)	-0.861*** (0.253)	-0.174*** (0.026)
ROLAW <sub>(t-1)</sub>		-9.778** (4.782)	-7.598*** (1.505)	-0.134** (0.056)
SMCGDP <sub>(t-1)</sub>		5.262** (2.324)	2.908*** (0.793)	0.426*** (0.041)
CAPREG <sub>(t-1)</sub> * SDROAP <sub>(t-1)</sub>	-	-0.526*** (0.121)		
ROLAW <sub>(t-1)</sub> * SDROAP <sub>(t-1)</sub>	-		-1.669** (0.687)	
SMCGDP <sub>(t-1)</sub> * SDROAP <sub>(t-1)</sub>	-			0.730** (0.322)
CAPREG <sub>(t-1)</sub> * LLPP <sub>(t-1)</sub>	-	-0.140*** (0.046)		
ROLAW <sub>(t-1)</sub> * LLPP <sub>(t-1)</sub>	-		-1.657*** (0.261)	
SMCGDP <sub>(t-1)</sub> * LLPP <sub>(t-1)</sub>	-			0.473*** (0.131)
CAPREG <sub>(t-1)</sub> * LDRP <sub>(t-1)</sub>	-	-0.166*** (0.051)		
ROLAW <sub>(t-1)</sub> * LDRP <sub>(t-1)</sub>	-		-1.661*** (0.165)	
SMCGDP <sub>(t-1)</sub> * LDRP <sub>(t-1)</sub>	-			0.675*** (0.081)
SIZE		-0.260*** (0.088)	-0.461*** (0.054)	-0.070*** (0.0190)
GDPGR		-0.284* (0.165)	-0.100** (0.043)	-0.266*** (0.009)
Wald test (p-value)		0.000	0.000	0.000
J test (p-value)		0.838	0.420	0.502
Arellano–Bond test for AR(1) (p-value)		0.041	0.007	0.000
Arellano–Bond test for AR(2) (p-value)		0.111	0.561	0.279
N		307	307	306

Source: Data processing

## Notes:

The table reports the result of robustness test regarding the correlations between parent and subsidiary bank risk in this study. The correlation is \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels, respectively. SDROAS is a total risk of the subsidiary banks, NPLS is a non-performing-loans-ratio of the subsidiary banks, LIQATAS is a loans-to-deposits-ratio of the subsidiary banks, SDROAP is a total risk of the parent banks, NPLP is a non-performing-loans-ratio of the parent banks, LIQATAP is a loans-to-deposits-ratio of the parent banks. CAPREG is the capital adequacy ratio of the host countries. CONCOR is a national governance of the host countries, PSCGDP is a financial deepening of the host countries, SIZE is a total asset of the subsidiary banks and GDPGR is a growth rate in GDP of the host countries.

## CONCLUSION

To explore the presence of the international transmission of bank risk, we investigate the relationship between parent and subsidiary bank risk using a sample of 43 foreign banks operating in ASEAN countries from 2010-2018. In addition, we examine the effect of bank regulation, national governance, and financial deepening in host countries on the relationship. Using the dynamic panel data, we find a positive and significant relation between parent and subsidiary bank risk, particularly for credit and liquidity risks. Bank regulation and national governance play a significant role in reducing the risk of transmission. In contrast, financial deepening amplifies the transmission.

Our findings have several important policy implications for banking regulation and oversight. This is especially important in the ASEAN context, a region that has witnessed significant growth and expansion of the financial services sector, partly driven by foreign investments. This expansion has opened up new opportunities and created new challenges against the backdrop of developing institutions that make the services sector vulnerable to risks from overseas.

Thus, since our study has demonstrated the effectiveness of national governance in mitigating risk transmission, bank regulators need to focus more on innovative and more effective approaches to designs of new policy instruments and implementation of best practices in good governance both at macro and micro levels. Good governance for risk transfer makes it possible to protect stakeholders, including investors, from losses from transferred risks, thereby reducing potential systemic risk. Secondly, since bank regulation (particularly capital regulation) can limit risk transmission, it is justified for bank regulators to take additional steps to adopt international best practices in capital regulation, including Basel III. Finally, since financial deepening can strengthen risk transmission, bank regulators need to be very careful while implementing financial deepening programs to ensure that they will not damage the banking system.

## REFERENCES

- Abou-El-Sood, H., & Shahin, R. (2023). Bank Competition, Regulatory Capital, and Risk Taking: International Evidence. *Managerial Finance*, 49(10), 1614-1640. <https://doi.org/10.1108/MF-06-2022-0277>.
- Agusman, A., Cullen, G.S., Gasbarro, D., Monroe, G.S. & Zumwalt, J. K. (2014). Government Intervention, Bank Ownership and Risk-Taking During the Indonesian Financial Crisis. *Pacific-Basin Finance Journal*, 30, 114-131. <https://doi.org/10.1016/j.pacfin.2014.07.003>
- Agusman, A., Monroe, G.S., Gasbarro, D. & Zumwalt, J.K. (2008). Accounting and Capital Market Measures of Risk: Evidence from Asian Banks During 1998-2003. *Journal of Banking and Finance*, 32(4), 480-488. <https://doi.org/10.1016/j.jbankfin.2006.06.018>.
- Almekinders, G., Fukuda, S., Mourmouras, A., Zhou, J., & Zhou, Y. S. (2015). ASEAN Financial Integration. *IMF Working Paper WP/15/34*.

- AlZoubi, M. S., Alkhatib, A.S., Alsmadi, A. A., Kasasbeh, H. A. (2022). Bank Size and Capital: A Trade-off Between Risk-Taking Incentives and Diversification. *Banks and Bank Systems*, 17(4), 1-11. [https://doi.org/10.21511/bbs.17\(4\).2022.01](https://doi.org/10.21511/bbs.17(4).2022.01).
- Anginer, D., Cerutti, E. & Peria, M.S.M. (2017). Foreign Bank Subsidiaries' Default Risk During the Global Crisis: What Factors Help Insulate Affiliates from Their Parents? *Journal of Financial Intermediation*, 29, 19-31. <https://doi.org/10.1016/j.jfi.2016.05.004>.
- Arcand, J.L., Berkes, E., & Panizza, U. (2015). Too Much Finance? *Journal of Economic Growth*, 20(2), 105-148. <https://doi.org/10.1007/s10887-015-9115-2>.
- Arellano, M. & Bond, S. (1991). Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations. *Reviews of Economic Studies*, 58(2), 277-297. <https://doi.org/10.2307/2297968>.
- Arellano, M. & Bover, O. (1995). Another Look at the Instrumental Variable Estimation of Error-Component Models. *Journal of Econometrics*, 68(1), 29-51. [https://doi.org/10.1016/0304-4076\(94\)01642-D](https://doi.org/10.1016/0304-4076(94)01642-D).
- Athari, S. A., Irani, F., and AL Haddood, A. A. (2023). Country Risk Factors and Banking Sector Stability: Do Countries' Income and Risk-Level Matter? Evidence from Global Study. *Heliyon*, 9(10), e20398. <https://doi.org/10.1016/j.heliyon.2023.e20398>.
- Barra, C., & Ruggiero, N. (2023). Bank-Specific Factors and Credit Risk: Evidence from Italian Banks in Different Local Markets. *Journal of Financial Regulation and Compliance*, 31(3), 316-350. <https://doi.org/10.1108/JFRC-04-2022-0051>.
- Blundell, R., & Bond, S. (1998). Initial Conditions and Moment Restrictions in Dynamic Panel Data Models. *Journal of Econometrics*, 87(1), 115-143. [https://doi.org/10.1016/S0304-4076\(98\)00009-8](https://doi.org/10.1016/S0304-4076(98)00009-8).
- Borsuk, M., Kowalewski, O., & Pisany, P. (2022). State-Owned Banks and International Shock Transmission. *European Central Bank Working Paper Series 2661(5)*,
- Cao, Y., Smith, I. G., & Montagnoli, A. (2018). Transmission of Liquidity Shocks: Evidence on Cross-Border Bank Ownership Linkages. *Journal of International Financial Markets, Institutions and Money*, 53, 158-178. <https://doi.org/10.1016/j.intfin.2017.09.017>.
- Cerutti, E., & Claessens, S., & Laeven, L. (2017). The Use and Effectiveness of Macroprudential Policies: New Evidence. *Journal of Financial Stability*, 28(C), 203-224.
- Chen, S. H., & Hsu, F. J. (2022). National Governance Differences and Foreign Bank Performance in Asian Countries: The Role of Bank Competition. *Computational Economics*, 59(4), 1283–1333. <https://doi.org/10.1007/s10614-021-10213-7>.
- Dat, P. T. & Nguyen, K.Q.T. (2023). Foreign Ownership and National Governance Quality Affect Liquidity Risk – Case in Vietnam. *Cogent Business & Management*, 10, 2244752. <https://doi.org/10.1080/23311975.2023.2244752>.
- Dias, R. (2021). Capital Regulation and Bank Risk-Taking – New Global Evidence. *Accounting and Finance*, 61(1), 847-884. <https://doi.org/10.1111/acfi.12595>.



- Duy Suu, N., Nhan do, Thủy, H. X., & Wong W. K. (2023). Impact of Foreign Ownership and Foreign Bank Presence on Liquidity Risk: Evidence from Viet Nam. *Advances in Decision Sciences*, 27(1), 23-44.
- Frame, W. S., Mihov, A., Sanz, L. (2020). Foreign Investment, Regulatory Arbitrage, and the Risk of U.S. Banking Organizations. *Journal of Financial and Quantitative Analysis*, 55(3), 955–88 <https://doi.org/10.1017/S0022109019000267>.
- Goyal, R., Marsh, C., Raman, N., Wang, S. & Ahmed, S. (2011). Financial Deepening and International Monetary Stability. *IMF Staff Discussion Note*, SDN/11/16.
- Hamid, B. A., Azmi, W. & Hamid, M. A. (2020). Bank Risk and Financial Development: Evidence Form Dual Banking Countries. *Emerging Markets Finance and Trade*, 56(2), 286-304. <https://doi.org/10.1080/1540496X.2019.1669445>.
- Ho, C., Huang, S., Shi, H. & Wu, J. (2018). Financial Deepening and Innovation: The Role of Political Institutions. *World Development*, 109, 1–13. <https://doi.org/10.1016/j.worlddev.2018.02.022>.
- Karyani, E., Dewo, S. A., Santoso, W., & Frensidy, B. (2020). Risk Governance and Bank Profitability in ASEAN-5: A Comparative and Empirical Study. *International Journal of Emerging Markets*, 15(5), 949-969. <https://doi.org/10.1108/IJOEM-03-2018-0132>.
- Karyani, E., Kolade, O., & Dewo, S. A. (2021). Risk Governance, Market Competition and Operational Risk Disclosure Quality: A Study of the ASEAN-5 Banking Sector. *Journal of Operational Risk*, 16(2), 61–86. <https://doi.org/10.21314/IJOP.2021.004>.
- Ketokivi, M., & McIntosh, C. N. (2017). Addressing the Endogeneity Dilemma in Operations Management Research: Theoretical, Empirical, and Pragmatic Considerations. *Journal of Operations Management*, 52, 1-14. <https://doi.org/10.1016/j.jom/2017.05.001>.
- Kurowski, Ł., Gajewski, K. (2021). Agency Problems in Multinational Banks: Does Parent Complexity Affect The Risk-taking of Subsidiaries? *Journal of Credit Risk*, 17(4), 43-69. <https://doi.org/10.21314/JCR.2021.010>.
- Morales, P., Osorio, D., Lemus, J.S., Sarmiento, M. (2022). The Internationalization of Domestic Banks and the Credit Channel of Monetary Policy. *Journal of Banking and Finance*, 135, 106317. <https://doi.org/10.1016/j.jbankfin.2021.106317>.
- Nakpodia, F. & Adegbite, E. (2018). Corporate Governance and Elites. *Accounting Forum*, 42(1), 17–31. <https://doi.org/10.1016/j.accfor.2017.11.002>.
- Naqvi, H., & Pungaliya, R. S. (2023). Bank Size and the Transmission of Monetary Policy: Revisiting the Lending Channel. *Journal of Banking & Finance*, 146, 106688. <https://doi.org/10.1016/j.jbankfin.2022.106688>.
- Nguyen, T., L., A. (2018). Diversification and Bank Efficiency in Six ASEAN Countries. *Global Finance Journal*, 37, 57-78. <https://doi.org/10.1016/j.gfj.2018.04.004>.
- Nwosu, C. P., Itodo, I. A., & Ogbonnaya-Orji, N. (2021). Financial Deepening, Financial System Fragility and Economic Growth in Nigeria. *Economic and Financial Review*, 59(1), 1-26.

- Otero, L., Alaraj, R. & Lado-Sestayo, R. (2020). How Corporate Governance and Ownership Affect Banks' Risk Taking in the MENA Countries? *European Journal of Management and Business Economics*, 29(2), 182-198. <https://doi.org/10.1108/EJMBE-01-2019-0010>.
- Perić, B. Š., Smiljanić, A. R., & Aljinović, Z. (2018). Credit Risk of Subsidiaries of Foreign Banks in CEE Countries: Impacts of the Parent Bank and Home Country Economic Environment. *North American Journal of Economics and Finance*, 46, 49-69. <https://doi.org/10.1016/j.najef.2018.03.009>.
- Qureshi, A. & Lamarque, E. (2023). Risk Management Practices and Credit Risk of the Significantly Supervised European Banks. *Journal of Financial Regulation and Compliance*, 31(3), 261-280. <https://doi.org/10.1108/JFRC-12-2021-0117>.
- Roberts, M. R., & Whited, T. M. (2013). Endogeneity in Empirical Corporate Finance. In Constantinides, G. M., Harris, M., & Stulz, R. M. (Eds). *Handbook of the Economics of Finance*, 2(Part A), 493–572. <https://doi.org/10.1016/b978-0-44-453594-8.00007-0>.
- Sahay, R., Čihák, M., N'Diaye, P., Barajas, A., Bi, R., Ayala, D., Gao, Y., Kyobe, A., Nguyen, L., Saborowski, C., Svirydzenka, K. & Yousefi, S.R. (2015). Rethinking Financial Deepening: Stability and Growth in Emerging Markets. *IMF Staff Discussion Note SDN/15/08*.
- Schnabl, P. (2012). The International Transmission of Bank Liquidity Shocks: Evidence from an Emerging Market. *Journal of Finance*, 67(3), 897-932. <https://doi.org/10.1111/j.1540-6261.2012.01737.x>.
- Wihardja, M.M. (2013). Financial Integration Challenges in ASEAN beyond 2015. *Working Papers DP-2013-27*. Economic Research Institute for ASEAN and East Asia (ERIA).
- Williams, B. (2014). Bank Risk and National Governance in Asia. *Journal of Banking and Finance*, 49, 10-26. <https://doi.org/10.1016/j.jbankfin.2014.08.014>.
- Yan, G. (2022). Research on the Policy Environment on the Risk of Multinational Banks - Based on the Analysis of Regional Regulatory Policies and Multinational Banks. *Proceedings of the 2022 International Conference on Economics, Smart Finance and Contemporary Trade (ESFCT 2022)*.