

# The role of activity restrictions on financial intermediation costs in ASEAN countries

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## Abstract

**Purpose** – The purpose of this study is to examine the role of activity restrictions on the financial intermediation costs in ASEAN countries.

**Design/methodology/approach** – This study used the two-step system generalized method of moments approach to tackle the endogeneity problems. The sample consists of 130 banks from ASEAN countries covering the over 2009–2022 period.

**Findings** – This study provides valuable insights into various dimensions of activity restrictions within the banking across ASEAN countries. The findings highlight that imposing restrictions on activities such as securities, insurance and real estate can significantly elevate intermediation costs, affecting the overall efficiency of the banking sector. Furthermore, restrictions on ownership lead to higher intermediation costs by limiting operational flexibility, thereby constraining banks' ability to optimize their financial services.

**Research limitations/implications** – The sample of this study is limited to banks in ASEAN countries and focuses only on the regulations restricting banking activities.

**Practical implications** – The findings suggest that policymakers should conduct a comprehensive review and potential adjustment of the existing regulatory framework related to restrictions on banking activities to strike an optimal balance between risk mitigation and fostering an environment that enhances banks' efficiency. In addition, regulators could consider introducing regulatory reforms to ownership-related restrictions to promote greater flexibility and adaptability in the banking sector.

**Originality/value** – This research contributes to the field of banking by offering valuable insights for policymakers and regulators in ASEAN countries. It provides empirical evidence on the impact of activity restrictions on financial intermediation costs, highlighting key factors for developing more effective regulatory strategies.

**Keywords** Activity restrictions, Cost of intermediation, ASEAN, Margins

**Paper type** Research paper

## 1. Introduction

Effective banking regulations also play a critical role in achieving Sustainable Development Goals (SDG) 8 (decent work and economic growth). This goal promotes sustained economic growth and financial stability. By implementing strong regulatory frameworks, banks can foster a stable financial environment that facilitates economic growth, thereby contributing to broader societal goals of inclusive and sustainable development. [Dietrich and Hauck](#)

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(2014) argue that banking regulations significantly impact the sector's performance, providing a safety net for fragile financial systems. On the other hand, [Saunders et al. \(2021\)](#) further emphasize that regulatory measures safeguard depositors and borrowers from potential risks that could undermine the banking system. However, [Yang et al. \(2019\)](#) point out that regulations also introduce costs and complexities, which can challenge the balance between maintaining stability and achieving operational efficiency. This dual impact of regulations on bank performance has led to ongoing research exploring these diverse perspectives.

Several studies have been exploring the role of regulations on the efficiency and performance of banking system encompasses various forms of regulations and supervision ([Angori et al., 2019](#); [Athari and Bahreini, 2023](#); [Birchwood et al., 2017](#); [Boamah et al., 2023](#); [Bouteska et al., 2023](#); [Chortareas et al., 2012](#); [Demirguc-Kunt et al., 2004](#); [Khan et al., 2021](#); [Khan et al., 2023](#)). In their study, [Athari and Bahreini \(2023\)](#) find that Arab Islamic banks have strong external governance mechanisms and operate within a well-defined regulatory framework, enhancing the banking system's profitability. [Birchwood et al. \(2017\)](#) found that lowering the barriers to entry for banks can be beneficial for borrowers and savers, but it may negatively impact bank owners due to decreased loan interest rates and increased deposit interest rates. Then, [Bouteska et al. \(2023\)](#) investigate the effects of activity limitations, the requirements of capital, as well as the authority of supervisors in supervising banks on the effectiveness of the financial system. Their findings indicate that all of these variables significantly affect banks' performance. Overall, different regulations have different impacts on banks' performance and efficiency.

In the wake of the Asian Financial Crisis and the Global Financial Crisis, banking regulations have taken center stage in safeguarding financial systems. ASEAN countries, in particular, have undergone sweeping reforms, including restrictions on bank activities ([OECD, 2022](#)). The surveys revealed that ASEAN countries adhere to regulatory frameworks that impose different restrictions on various banking activities. Yet the question remains – Is the implementation of these restrictions on banking activities optimizing banking performance, particularly in terms of reducing intermediation costs and improving efficiency? The question arises because restrictions on banking activities, such as limits on securities, insurance and real estate engagements, could impact efficiency in two ways. On one hand, such restrictions might enhance efficiency by focusing banks on their operations, potentially leading to lower intermediation costs. On the other hand, these restrictions could impede efficiency by limiting banks' ability to diversify their income streams, which may increase intermediation costs and reduce overall performance ([Barth et al., 2013](#)).

According to [Samake \(2023\)](#), prudential restrictions on banking activities are implemented to ensure the safety and stability of banks, which helps prevent financial distress. These limitations can yield advantages for banking institutions by mitigating conflicts of interest, reducing excessive risk-taking and fostering competition and efficiency ([Noman et al., 2021](#); [Barth et al., 2004](#)). Besides that, they are designed to manage the risks faced by banks ([Noman et al., 2021](#)). Nevertheless, a wide range of activities allows banks to expand into nontraditional ventures, generating fees and profits, which leads to greater risk diversification and improved risk management ([Claessens and Kodres, 2014](#)). Conversely, [Chortareas et al. \(2012\)](#) stated that banks might increase regulatory burdens by engaging in riskier activities, which may interfere with the efficient running of banks. Therefore, implementing activity limitations, while beneficial for reducing intermediation costs and promoting stability, requires careful consideration of the regulatory framework by policymakers.

Despite extensive research, the impact of specific regulations – particularly those restricting banking activities – on banks' performance and efficiency remains underexplored.

Poghosyan (2013) found that activity constraints limit banks' ability to engage in securities markets, insurance and real estate-related activities, while ownership of shares in nonfinancial enterprises can reduce intermediation costs in low-income countries. Conversely, Chortareas *et al.* (2012) argued that such restrictions can reduce operational efficiency. Similarly, Bouteska *et al.* (2023) demonstrated that activity restrictions negatively impact bank performance in European countries. These differing perspectives highlight the complexity of regulating bank activities and underscore the need for further research.

This paper aims to fill this gap by providing empirical evidence on how activity restrictions, including those related to securities, real estate and investment activities, as well as ownership, affect financial intermediation costs in the ASEAN region. By focusing on these specific areas, the study offers valuable insights for bank regulators and policymakers on balancing regulation with banking efficiency and performance. This research undertakes a concentrated analysis of a singular regulatory factor: the influence of limitations on bank activities on the effectiveness of the banking system. The investigation of this paper focused on the limitations enforced by regulatory bodies on the operations of banks, providing insights into the potential policy ramifications for these financial institutions. Moreover, this paper focuses on evaluating the effect of regulations, specifically in the time following the global financial crisis, spanning from 2009 to 2022. The topic at hand holds significant importance in light of the current discourse among policymakers and scholars over the efficacy of regulatory measures implemented after the crisis (Schaeck and Cihák, 2014). The empirical findings provide valuable insights into the potential advantages of achieving a harmonious equilibrium between regulatory constraints and the operational efficiency of banking systems within the ASEAN region. Furthermore, by examining the role of activity restrictions, this research can inform policymakers how to balance activities banks can associate, thereby contributing to a more stable banking sector. The findings of this study have the potential to guide policymakers in reviewing and adjusting existing regulatory frameworks. By identifying which activity restrictions enhance or hinder banking efficiency, regulators can design or adapt more effective regulations that promote sustainable economic growth and financial stability, thereby supporting SDG 8.

The subsequent sections of this study are structured in the following way: The elaborations of a comprehensive summary of the previous research conducted on regulations are presented in Section 2. Then, in the following section, this research explores the data and methodologies used in this study. Finally, Section 4 delves into a detailed analysis and interpretation of the findings. Furthermore, the final section offers a set of concluding reflections alongside policy implications.

## 2. Literature review

According to Alam's (2014) study, banking regulation may be defined as a comprehensive framework that governs banks' operation and liquidation within a given economy. Rogers (2019) analyzes the various justifications for implementing these restrictions, which include ensuring the safety and stability of the financial system, fostering a climate of fair competition and protecting the interests of consumers. In addition, Saunders *et al.* (2021) emphasize the diverse risks the banking sector faces. These risks include credit risk, which is connected to the assets held by banks; interest rate risk, which arises from differences in the maturity of assets and liabilities; and liquidity risk, which is associated with the possibility of liability withdrawals. These risks create plausible concerns among researchers and regulators, which suggests the importance of a tailored regulatory framework within the banking sector. Therefore, the Bank Regulation and Supervision Surveys are introduced to assist banking authorities in improving the effectiveness and supervision of the banking industry.

In theory, the role of regulation and supervision on banks' performance and banks' efficiency is limited. Theories governing regulations are rooted in economic perspectives, which can be divided into the public interest perspective and the private interest perspective (Barth *et al.*, 2008). The former stated that the regulations imposed by banks promote efficient finance and mitigate market failures. In contrast, the regulations are used to enhance the interests of a few rather than the general public from a private interest perspective.

According to the public interest view, effective regulatory frameworks can increase efficiency by fostering competition among banks and facilitating efficient bank management. However, the private interest view contends that regulation might hinder efficiency by pressuring banks to prioritize politically favored or influential individuals. This leads to allocating resources to special interest groups, such as politicians and their associates, rather than benefiting the broader public.

In their fundamental study, Barth *et al.* (2004) investigated the impact of regulations on the performance of a banking system. The authors specifically focus on key aspects such as capital sufficiency, supervisory authority, market discipline and private sector monitoring. This pioneering research sheds light on the relationship between these regulatory factors and the overall functioning of the banking system. This was followed by Demirguc-Kunt *et al.* (2004), who included regulations variables such as activity restrictions as the determinants of bank margins. Poghosyan (2013) also shows activity restrictions, the fraction of entry denied and reserve requirements as the determinants of bank margins in low-income and emerging market countries. Next, Birchwood *et al.* (2017) incorporate bank entry requirements and financial statement transparency as the factors affecting bank profit margins in Central America and the Caribbean. Their study demonstrates that both of these variables have a beneficial effect on bank margins in the region. In other words, the study proposed that the regulatory measures that promote easier entry for banks and encourage transparent financial reporting practices can enhance profitability for banks operating in the region. Meanwhile, in the context of OECD countries, Cruz-García and Fernández de Guevara (2019) discovered that higher capital requirements enhance their profitability. The positive association between deposit insurance schemes and bank margins suggests that the perception of safety and security provided by deposit insurance can attract more deposits and customers to a bank, potentially leading to higher profitability.

Mia (2023) conducted an analysis of the relationship between capital limits and bank profitability, focusing on the context of Bangladesh's banking sector. Her findings reveal a favorable association between regulatory capital requirements and bank profitability, highlighting the significant impact of these requirements on enhancing bank margins in Bangladesh. According to Rahman *et al.* (2023), a positive correlation exists between intermediation costs and activity restrictions. This suggests that increasing the limitations imposed on bank activities could lead to higher profit margins in ten emerging economies (EEs). Yudaruddin (2022) identified a need for stronger capital regulation and enhanced supervisory authority in the financial sectors of five central Asian countries. The study underscores the importance of addressing these aspects to effectively mitigate financial instability in the region. Strengthening capital regulations and improving the supervision of financial institutions are essential steps in promoting stability and resilience within the financial systems in these countries. Khan *et al.* (2023) also showed a significant impact of capital regulations, measured using total capital ratio and tier 1, on financial intermediation costs in the ASEAN region. Yakubu and Bunyaminu (2023) documented a favorable relationship between capital regulations and bank's stability in sub-Saharan Africa.

Godspower-Akpoiemie and Ojah (2021) conducted empirical research that provides valuable insights into the connection between market discipline and bank profitability. Their

study encompassed 20 EEs and 14 developed countries. The findings suggest that adopting market discipline significantly affects banks' profitability and stability. Notably, the impact appears to be more pronounced in EEs than developed ones, with a relatively smaller effect on bank profitability. Besides that, Carsamer *et al.* (2021) examined how the implementation of Basel III liquidity restrictions impacted the capital and liquidity reactions of banks in Ghana. Their research uncovers that banks effectively oversee and aim to simultaneously optimize capital, risk exposure and liquidity levels. The authors observe a direct relationship between capital and risk adjustments and an inverse relationship between bank capital and liquidity. Meanwhile, Athari and Bahreini (2023) conducted a study on the influence of external governance mechanisms and regulatory settings on the profitability of Islamic banks in Arab markets between 2003 and 2017. The findings emphasize the importance of political stability, regulatory quality, the rule of law and control of corruption in driving profitability. On the other hand, some aspects of regulatory settings, such as the level of transparency and accessibility of shareholder lawsuits, can have a detrimental effect on profitability. The results, which remain consistent across various estimation methods, highlight the crucial role of external governance in influencing the profitability of Islamic banks.

In sum, various regulation variables have been discussed in previous literature. Given the importance of conducting research on bank regulations and supervision for banks' performance and efficiency, this paper also explored the relationship between regulations and intermediation costs. However, this paper only focuses on one type of regulation: activity restrictions. Studies are conducted on one type of regulation, but mostly on capital regulations and market discipline. Hence, this paper filled the gap by conducting research on the impact of activity restrictions on financial intermediation costs. Activity restrictions are particularly important because they limit the range of activities that banks can engage in, such as securities trading, insurance and real estate investments. These restrictions are designed to reduce excessive risk-taking by preventing banks from expanding into nontraditional, higher-risk ventures that could threaten financial stability. By focusing on core banking activities, activity restrictions enhance risk management, mitigate conflicts of interest and promote a more stable financial system. Therefore, understanding the impact of these restrictions on financial intermediation costs fills a crucial gap in the literature and provides valuable insights for developing more effective regulatory frameworks.

### 2.1 Activity restrictions

Barth *et al.* (2006) presented two contradictory perspectives regarding the effects of activity restrictions. The first perspective, the private interest perspective, proposes that restrictions on bank activities limit economies of scope and scale and impede the banks' capacity for diversification. Based on this perspective, there is expected to be a negative correlation between the limitation of activity and the efficiency of banks. Conversely, the public interest perspective posits that financial activities could heighten moral hazard concerns and create more possibilities for banks to increase risk-taking behavior. Thus, this causes the supervision and regulation of these activities to be challenging, as they become too difficult to regulate.

The activity restrictions indicator has been widely used as a factor of banks' stability, efficiency, risk-taking and competition (Angori *et al.*, 2019; Barth *et al.*, 2004, 2013; Chortareas *et al.*, 2012; Carsamer *et al.*, 2021; Bouteska *et al.*, 2023; Boamah *et al.*, 2023). Chortareas *et al.* (2012) show that tighter restrictions imposed on banks' activities, such as securities, are associated with high bank margins, lowering banks' efficiency. Demircug-Kunt *et al.* (2004) find evidence of a positive correlation between activity restrictions and banks' profit margins. These findings indicate that stricter regulations on bank activities are linked to higher bank profit margins. Conversely, Barth *et al.* (2004) observe a lack of

significance in the influence of regulatory constraints on bank activities on intermediation costs. Interestingly, [Poghosyan \(2013\)](#) reveals that activity restrictions impact low-income and emerging countries differently. For example, the result concludes that activity restrictions do not impact bank margins in low-income countries. Meanwhile, in emerging countries, activity restrictions positively affect bank margins because more developed nonbank financials lead to more competition, increasing the need for restrictions on bank activities for margins. In the Euro Area, [Angori et al. \(2019\)](#) found that stringent activity restrictions will alleviate the bank margins as it will increase the operating costs.

Numerous researchers have undertaken studies to investigate how activity restrictions, as a component of regulatory measures, affect the cost of intermediation. It was noted that activity restrictions influence the cost of intermediation, both positively and negatively. However, there is limited research on the correlation between activity limits and the cost of intermediation. [Noman et al. \(2021\)](#) investigate the impact of banking activity limitation on banks' tendency to be involved in risk-taking behavior. Likewise, the effect of activity limitations on the expense of intermediation in ASEAN nations remains ambiguous. [Li and Li \(2022\)](#) examined the correlation between activity limitation and bank efficiency, specifically focusing on the Asia-Pacific region. Therefore, this paper evaluates each component of activity restrictions on the cost of intermediation to provide a better insight for the regulator on its impact.

*2.1.1 Securities activity.* According to [Barth et al. \(2004\)](#), the activities of banks, including securities underwriting, brokering, trading and certain parts of the mutual fund business, can be categorized as securities activities. From the public interest perspective, imposing regulations on security activity helps mitigate excessive risk-taking and potential conflicts of interest, ultimately leading to a more stable financial system. In contrast, private interest theory suggests that regulations on securities activities might be influenced by the lobbying efforts of large financial institutions that stand to benefit from more lenient rules. This can lead to regulatory capture, where the regulations are shaped to benefit certain interest groups rather than the public. Hence, the hypothesis is developed as follows:

*H1.* There exists a positive association between securities activity and cost of intermediation.

*2.1.2 Insurance activity.* The insurance activities reflect the ability of banks to engage in insurance underwriting and selling ([Barth et al., 2004](#)). The public interest view suggests that the implementation of regulations on insurance activities within banks is intended to prevent conflicts of interest and ensure that banks do not take excessive risks. By maintaining strict regulations, regulators can help protect the financial system and consumers, ensuring that banks remain solvent and reliable. From the private interest perspective, insurance regulations could be influenced by insurance companies or financial conglomerates that seek to expand their market share. This could lead to regulations that favor certain institutions, potentially increasing the cost of intermediation. Henceforth, the hypothesis is written as:

*H2.* There exists a positive association between insurance activities and the cost of intermediation.

*2.1.3 Real-estate activity.* The real-estate activities explain the banks' ability to engage in real estate investment, development and management ([Barth et al., 2004](#)). On the one hand, the public interest view suggests that regulations on real estate activities are intended to prevent risky investments and to ensure that banks do not overextend themselves in volatile markets. This protects the stability of the banking system. On the other hand, private interest theory would suggest that real estate regulations might be introduced by certain interest

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groups that are beneficial to them. This could result in banks taking on greater risks, potentially increasing intermediation costs. Therefore, the hypothesis is:

*H3.* There exists a positive association between real-estate activity and the cost of intermediation.

*2.1.4 Firm ownership.* The level of regulatory constraints pertaining to the integration of banking and commerce and the degree of restrictiveness regarding ownership are being discussed. The concept of banks owning nonfinancial firms refers to assessing limitations imposed on banks concerning their ownership and control over nonfinancial firms. Conversely, nonfinancial firms owning banks evaluate constraints placed on nonfinancial firms regarding their ownership and control over banks (Barth *et al.*, 2004). Regulations on firm ownership are designed to prevent conflicts of interest and ensure that banks remain focused on their core financial functions. By limiting ownership stakes in nonfinancial firms, regulators aim to maintain the integrity and stability of the banking system. According to private interest theory, regulations on firm ownership might be influenced by large conglomerates seeking to leverage their financial power. This could lead to regulations that allow for greater integration of banking and commerce, potentially increasing the complexity and costs of intermediation. The hypothesis is then given as:

*H4.* There exists a positive association between firm ownership and the cost of intermediation.

### 3. Methodology

#### 3.1 Data

The banking data are taken from the FitchConnect database, which is part of Fitch Solutions. This database has financial records from banks worldwide that have been made public. The data have been put into a standard format that makes comparing statistics from different countries easy. It seems right to do an extensive study across the whole country. Logarithms are used to figure out the big numbers, even though most factors are ratios (except for the total assets). The activity restriction variables were then taken from the World Bank's Regulation and Supervisory Database. The World Development Indicators, on the other hand, include information about the economy, such as the GDP growth rate and inflation rate. At first, the sample group was made up of 207 business banks, both Islamic and non-Islamic. Following Beck *et al.* (2013), a few filtration steps are used to get the end sample. This paper focuses on consolidated banks where only income statement variables are available. Hence, banks and countries that do not have the data needed for the cost of intermediation, as well as macroeconomic and regulatory factors, are being removed. After the screening process is done, the sample is made up of a total of 130 banks. The data set used in this paper is unbalanced panel data spanning from 2009 to 2022.

#### 3.2 Model development and specification

The model used in this research is an enhanced iteration of the model initially proposed by Ho and Saunders (1981). As Poghosyan (2013) and Birchwood *et al.* (2017) suggested, the augmented model introduces supplementary elements, specifically regulatory variables, alongside the preexisting determinants encompassing banking market structure, risk aversion level, average size of bank transactions and interest rate volatility. Thus, the baseline model (1) was developed as below:

$$COI_{ijt} = \beta_1 l.COI_{ijt} + \beta_2 Bank_{ijt} + \beta_3 Industry_{ijt} + \beta_4 Macro_{jt} + \beta_5 AR_{jt} + \varepsilon_{ijt} \quad (1)$$

where:

$COI_{ijt}$  = cost of intermediation;

$Bank_{ijt}$  = bank size, risk aversion, bank efficiency, credit risk and liquidity;

$Industry_{ijt}$  = Herfindahl index (HHI);

$Macro_{jt}$  = inflation and GDP growth, and

$AR_{jt}$  = securities activities, insurance activities, real-estate investment activities and ownership.

The model is tested using the generalized method of moments (GMM). GMM is widely used in academic literature, especially in the context of regulations as the predominant approach (Chortareas *et al.*, 2012; Birchwood *et al.*, 2017; Tongurai and Vithessonthi, 2020; Mía, 2023; Rahman *et al.*, 2023; Khan *et al.*, 2023). Therefore, this study chooses the GMM approach to address the endogeneity problem that may arise from the independent variables. GMM approach helps reduce endogeneity problems, such as simultaneity, omitted variable bias and measurement error, which can lead to biased and inconsistent parameter estimates in ordinary least squares regression. GMM was introduced initially by Arellano and Bond (1991) and subsequently refined by Arellano and Bover (1995) and Blundell and Bond (1998). Consequently, there are several underlying assumptions associated with this estimator. The underlying assumptions of the analysis involve the elimination of unobserved individual effects through the application of first differencing in the equation. In addition, it is necessary for the lag-dependent variable to exhibit dynamic behavior. The validity of the instruments is determined by performing a Hansen test to examine overidentifying restrictions and a test to examine the serial correlation of residuals. By addressing these issues, GMM ensures more reliable and robust results, making it a preferred method for this paper. Overall, the GMM approach not only enhances the accuracy of the estimates but also strengthens the validity of the findings, providing valuable insights into the regulatory impact on banking performance and efficiency.

### 3.3 Variables descriptions

The list of measurements of variables incorporated in this paper is presented in Table 1. Financial intermediation costs refer to the expenses associated with banks facilitating transactions between savers and borrowers. Bank margins are often used as a proxy for the cost of intermediation because they encapsulate the difference between the cost of acquiring funds (interest paid on deposits) and the revenue generated from lending (interest received on loans). A high margin indicates that the bank effectively manages its intermediation costs, while a lower margin might suggest higher costs or inefficiencies. Thus, examining bank margins provides insights into the efficiency and cost-effectiveness of financial intermediation in the banking sector. Efficient banks with lower intermediation costs can offer more competitive rates, benefiting the economy by promoting more lending and saving activities.

Ho and Saunders (1981) observed a positive correlation between bank size and margins in their study. Banks with larger profit margins typically possess greater size and operate within a broader economic scope. Nevertheless, Zheng *et al.* (2017) discovered adverse results, illustrating that economies of scale have a diminishing effect on costs. Therefore, this research predicts a beneficial correlation between bank size and intermediation costs.

Cruz-García and Fernández de Guevara's (2019) study shows a favorable correlation between risk aversion and bank margins. The researchers used the equity-to-total assets ratio as an indicator to assess this relationship. The authors portray banks with a reduced



**Table 1.** Descriptions of variables

Variables	Proxy	Source	Expected sign
Cost of intermediation	Interest income minus interest expenses/interest-earning assets (Rahman <i>et al.</i> , 2023)	FitchConnect	
<i>Bank-specific variables</i>			
Bank size	Natural logarithm of total assets (Djalilov and Piesse, 2019)	FitchConnect	+/-
Degree of risk aversion	Equity/asset ratio (Poghosyan, 2013)	FitchConnect	+
Credit risk	Loan loss reserves/gross loans (Chortareas <i>et al.</i> , 2012)	FitchConnect	+
Liquidity	Total liquid assets divided by total assets (Demirguc-Kunt <i>et al.</i> , 2004)	FitchConnect	+
Bank efficiency	Cost to income ratio (Rahman <i>et al.</i> , 2023)	FitchConnect	-
<i>Market-specific variables</i>			
HHI index	The sum of the square of market share (Rahman <i>et al.</i> , 2023)	FitchConnect	+
<i>Macroeconomic variables</i>			
GDP growth	Annual percentage growth rate of GDP (Sirait and Rokhim 2019)	Worldbank	-
Inflation	The changes in the consumers' price index (Chortareas <i>et al.</i> , 2012)	Worldbank	+
Interest rate risk	The proxy used is standard deviation of monthly lending rate (Birchwood <i>et al.</i> , 2017)	Worldbank and own calculation	+
<i>Regulations: Activity restrictions</i>			
Securities activity	Bank's ability to engage in the business of securities underwriting, brokering, dealing and all aspects of the mutual fund industry (Barth <i>et al.</i> , 2004)	Barth <i>et al.</i> (2001, 2006, 2008, 2013)	-
Real-estate activity	Bank's ability to engage in real estate investment, development and management (Barth <i>et al.</i> , 2004)	Barth <i>et al.</i> (2001, 2006, 2008, 2013)	-
Insurance activity	Bank's ability to engage in insurance underwriting and selling (Barth <i>et al.</i> , 2004)	Barth <i>et al.</i> (2001, 2006, 2008, 2013)	-
Firm ownership	The restrictions placed on the ownership of banks	Barth <i>et al.</i> (2001, 2006, 2008, 2013)	-

**Source:** Authors' own compilation

inclination for risk-taking to impose higher interest margins. Therefore, it is anticipated that a positive sign will be observed.

Credit risk is a crucial issue in establishing loan interest rates in banking. For example, the longer the loan duration, the greater the interest rate. Angori *et al.* (2019) found a connection between high margins and high credit risk. This is because when banks have high margins, they tend to charge clients a greater risk premium, leading to increased financing costs. Banks that are confronted with increased uncertainty over the anticipated returns on their loans will need to impose higher interest rates to offset the risk of default.

Subsequently, interest rate risk has been incorporated as a determinant of bank margins in some studies. Birchwood *et al.* (2017) showed that the optimal interest margin was positively correlated with interest rate risk. Consequently, this study anticipates that the rise in interest rate risk will result in elevated costs of intermediation.

This study uses the total liquid asset to total asset ratio as an indicator for assessing liquidity, as defined by [Al-Matari \(2021\)](#). The authors revealed that liquidity is often reduced at institutions with larger liquidity ratios, impacting bank margins and intermediation costs. High liquidity ratios indicate that banks maintain a significant portion of their assets in liquid forms, such as cash or easily sellable securities, to meet withdrawal demands and loan requests. While this practice reduces liquidity risk and enhances the bank's ability to meet customer needs, it also comes with opportunity costs. These opportunity costs arise because liquid assets typically yield lower returns than loans and other long-term investments. As a result, banks might need to charge higher intermediation costs (reflected in higher interest rate margins) to compensate for the lower returns on their liquid assets. Consistent with prior research, this study expects that liquidity positively impacts bank margins.

The cost-to-income ratio indicates the cost efficiency, where it evaluates a bank's effectiveness in transforming noninterest costs into operating profit ([Yudaruddin, 2022](#)). The authors emphasized that banks with high unit costs may have reduced cost of efficiency, resulting in lower intermediation costs.

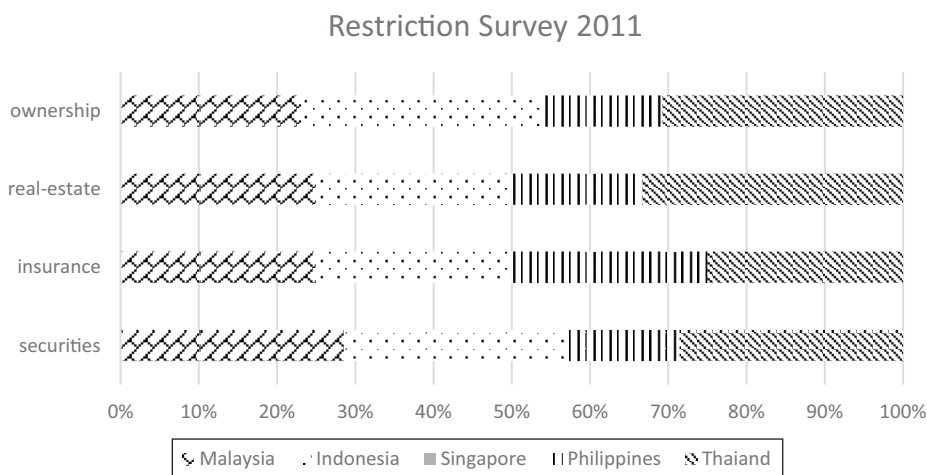
The market-specific variable used in this paper is the Herfindahl–Hirschman Index (HHI), followed by [Chortareas et al. \(2012\)](#). The authors found a positive association. Due to structural market imperfections and the resulting market power in concentrated markets, banks can set large margins, exploiting the highly inelastic demand and supply.

This paper also incorporates GDP and the inflation rate as key macroeconomic variables. [Athari and Bahreini \(2023\)](#) included GDP in their study and concluded a positive correlation between GDP and banks' performance. [Cruz-García and Fernández de Guevara \(2019\)](#) also stated that a rise in financial intermediation costs is associated with increased gross domestic product. In times of economic prosperity, banks typically have improved interest margins. However, this study expects a negative effect of GDP on bank margins. Following [Yakubu and Bunyaminu \(2023\)](#), this study calculates the inflation rate using the annual percentage change in the consumer price index. The authors observed a positive relationship between inflation and bank margins, suggesting that higher inflation rates result in higher bank margins.

Activity restrictions measure the degree to which national regulatory bodies give authorization to banks to engage in activities ([Barth et al., 2013](#)). A higher score indicates that there are more limitations placed on the ability of banks to participate in such activities. For instance, restrictions on securities, insurance, real estate and ownership of nonfinancial firms. The limitations imposed on securities activities indicate banks' capacity to participate in securities underwriting, brokering, dealing and various aspects of the mutual fund sector. Second, the restrictions on insurance activities portray banks' ability to engage in insurance underwriting and selling processes.

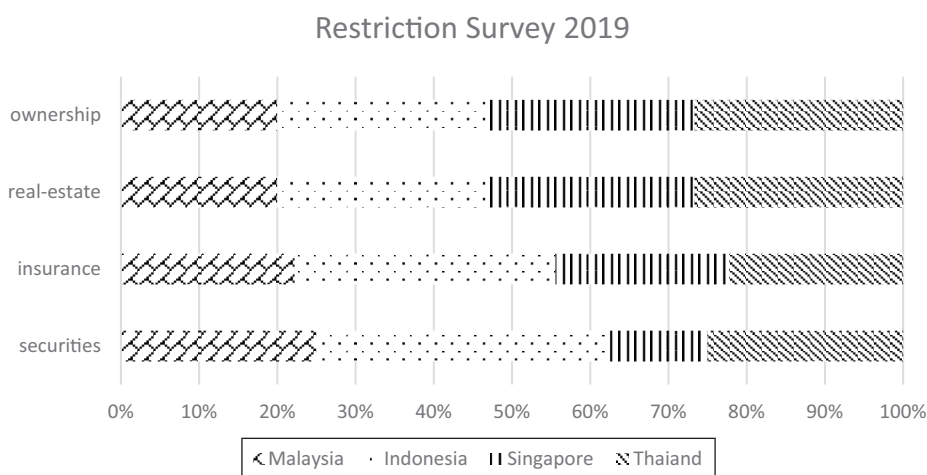
#### 4. Discussion and analysis

Consequently, the average value of the restrictions on bank activities in ASEAN nations is derived from four questions in the World Banking Regulation and Supervision database. This database collects information on various regulatory aspects of banking activities across countries. [Figures 1 and 2](#) provide information on the distribution of countries according to the degree of restrictiveness for the surveys conducted in 2011 and 2019. These figures illustrate how restrictions on bank activities varied among ASEAN countries over time. Specifically, the survey conducted in 2011 showed that none of the ASEAN countries were prohibited from engaging in securities activities. This reliance on the World Banking Regulation and Supervision database ensures that the data on bank activity restrictions are consistent and comprehensive across different countries and time periods.



**Source:** World Banking Regulation and Supervision and authors own calculation

**Figure 1.** The survey of activity restriction by countries in 2011



**Source:** World Banking Regulation and Supervision and authors own calculation

**Figure 2.** The survey of activity restrictions by countries in 2019

For example, the results recorded from the survey collected from the World Banking Regulation and Supervision database proposed that Thailand, Indonesia and Singapore prohibit banks from conducting real estate operations and from having different financial firms. Nevertheless, Malaysia’s banking system restricts those activities. The result from the survey could explain that limitations on nontraditional banking activities in ASEAN countries, such as engagement in real estate and owning nonfinancial firms, are significantly

connected with higher bank margins. The nontraditional banking activities would increase risk, restricting the market, management and regulators to assessing, monitoring and controlling risk-taking. Furthermore, the restrictions on securities and insurance activities are not tightened in all four countries in this study. For instance, Malaysia and Thailand allowed the banks to engage in securities and insurance activities but only in subsidiaries. Meanwhile, Singapore does not restrict securities activity and restricts insurance activities to be involved in subsidiary banks only. However, the limitation on bank activities such as securities and insurance in four ASEAN countries contradicts the regulations set by the Glass–Steagall Act, also known as the Banking Act of 1933. The act prohibits banks from engaging in risky securities activities to lower the risk of bank failure. Implementing more stringent regulations on nontraditional banking activities would diminish banks' capacity to monitor and handle market-related information regarding consumers effectively. Consequently, this would heighten the risk associated with providing other services to customers.

Table 2 portrays the estimations of the relationship between each component of activity restrictions on the cost of intermediation using GMM. The results showed that the restriction on activities such as securities, insurance and real estate would increase the cost of intermediation. However, the Glass–Steagall Act proposed that banks should be prohibited from participating in commercial banking (which includes traditional deposit-taking and lending activities) as well as securities or investment banking activities (Sametz *et al.*, 1979). The restriction of those activities was intended to prevent conflicts of interest and to protect the financial system. In other words, this act ensures that banks concentrate on their primary banking tasks and not participate in any speculative activity that would put depositors' funds at risk.

On the other hand, the Financial Services Modernization Act of 1999 significantly broadened the range of permissible operations for financial institutions, allowing financial institutions to engage in a broader range of financial services, such as commercial banking, investment banking and insurance underwriting Mamun *et al.* (2005). Tatom (2010) argues that the act was introduced to foster competition, innovation and efficiency in the financial services industry by allowing a diverse array of operations within a single institution. The effects of securities investment on the cost of intermediation are positive and significant which implies that tighter restrictions imposed on investment activities lead to high cost of intermediation. In other words, the limitations of those activities in the ASEAN banking system would help reduce intermediation costs, thereby enhancing banking sector efficiency. The observed correlation between limitations on activity and bank margins aligns with the findings of Barth *et al.* (2013) and Chortareas *et al.* (2012), who came to similar conclusions. According to the study by Chortareas *et al.* (2012), implementing strict regulations on bank operations may limit their ability to diversify, weakening the banks' financial position and increasing the incentives for engaging in illegal activity. When a bank operates under more stringent regulations that impose limitations on its activities, it is observed that the bank tends to exhibit increased profit margins. The increased stringency of regulations relating to nontraditional banking activity might challenge banks in effectively monitoring market trends and managing consumer information. Consequently, the issue increases the potential hazards associated with offering additional services to the customer base, resulting in increased customer costs. Furthermore, the restriction on bank activities would limit services provided to customers as the banks will fail to monitor and process information about customers (Barth *et al.*, 2013).

The results indicate a positive association is observed when examining the relationship between ownership and financial intermediation costs, aligned with Sensarma and Ghosh (2004). The positive association suggests that the increase in the level of regulatory constraints and the degree of ownership restrictions in integrating banking and commerce

**Table 2.** The GMM estimations of activity restriction on the cost of intermediation in the ASEAN banking system

	(1) COI	(2) COI	(4) COI	(5) COI	(6) COI	(7) COI	(8) COI
L. COI	0.7685*** (0.000)	0.7701*** (0.000)	0.7623*** (0.000)	0.7784*** (0.000)	0.7798*** (0.000)	0.7613*** (0.000)	0.7605*** (0.000)
<i>Bank specific indicators</i>							
Banks' size	0.1159*** (0.000)	0.1401*** (0.000)	0.4823*** (0.000)	-0.0690** (0.012)	-0.0882*** (0.000)	0.5121*** (0.000)	0.5328*** (0.000)
Risk aversion	0.0500*** (0.000)	0.0527*** (0.000)	0.0781*** (0.000)	0.0038*** (0.000)	0.0060*** (0.000)	0.0840*** (0.000)	0.0865*** (0.000)
Quality of management	-0.0001*** (0.000)	-0.0001*** (0.004)	-0.0001*** (0.000)	-0.0002*** (0.000)	-0.0002*** (0.000)	-0.0001*** (0.000)	-0.0001*** (0.000)
Liquidity	0.0064*** (0.000)	0.0080*** (0.000)	0.0046** (0.010)	0.0055*** (0.002)	0.0087*** (0.000)	0.0025 (0.172)	0.0036** (0.047)
Credit risk	0.0231*** (0.000)	0.0252*** (0.000)	0.0268*** (0.000)	0.0190*** (0.000)	0.0253*** (0.000)	0.0279*** (0.000)	0.0290*** (0.000)
<i>Industry-specific indicator</i>							
HHI index		0.0026 (0.293)	0.0003 (0.856)	0.0003 (0.500)	0.0010 (0.168)	0.0002 (0.904)	0.0004 (0.834)
<i>Macroeconomic variables</i>							
GDP			0.0431*** (0.000)	0.0472*** (0.000)	0.0381*** (0.000)	0.0360*** (0.000)	0.0322*** (0.000)
Inflation			0.0326*** (0.000)	0.0320*** (0.000)	0.0327*** (0.000)	0.0270*** (0.000)	0.0227*** (0.000)
Interest rate risk			0.1259*** (0.000)	-0.0142** (0.033)	-0.0408*** (0.000)	0.1364*** (0.000)	0.1451*** (0.000)
<i>Regulations factor: Activity restriction</i>							
Securities activity				0.4731*** (0.000)	0.7000*** (0.000)	0.1461*** (0.000)	0.2483*** (0.000)
Insurance activity							1.247
Real-estate activity							130
Ownership							100.1234
<i>N</i>	1,247	1,247	1,247	1,247	1,247	1,247	1,247
No of groups	130	130	130	130	130	130	130
Hansen test	93.1310	91.9622	100.8833	102.8678	101.7690	100.4482	100.1234
( <i>p-value</i> )	(0.2561)	(0.2588)	(0.0885)	(0.0793)	(0.0909)	(0.0814)	(0.0848)
AR (1)	-2.6270	-2.5886	-2.5579	-2.6496	-2.6481	-2.5432	-2.5357
( <i>p-value</i> )	(0.0086)	(0.0096)	(0.0105)	(0.0081)	(0.0081)	(0.0110)	(0.0112)
AR (2)	0.5247	0.4665	0.5614	0.9668	0.9894	0.4940	0.4886
( <i>p-value</i> )	(0.5998)	(0.6408)	(0.5745)	(0.3336)	(0.3225)	(0.6213)	(0.6251)
No of instrument	92	92	94	96	96	94	94

**Source:** Authors' own work

will increase the cost of intermediation. For example, where regulatory constraints are lenient and ownership rules are less restrictive, the ASEAN banking system may have more flexibility in its ownership structures. This flexibility allows them to diversify their income sources, leading to more stable banks. Consequently, these banks may not need to impose high intermediation costs on their customers. In other words, banks can explore various income-generating activities beyond traditional banking services, reducing their reliance on interest income alone. Furthermore, [Ogabo et al. \(2021\)](#) stated that ownership structures that allow the separation of ownership and control would create agency costs, leading to a decrease in shareholder investment, thereby causing the banks to charge high costs to customers.

Turning to control variables, the banking system's size portrays a negatively significant association with the cost of intermediation. The empirical findings of the quality of management (efficiency) measured by the cost-to-income ratio indicate that a high level of this ratio reflects less efficient management of the banking system and could increase bank margins. The results are in accordance with [Maudos and Solís \(2009\)](#). Consistent with the findings of [Birchwood et al. \(2017\)](#), interest rate risk shows a positive and substantial association with the cost of intermediation. The findings suggest that banks must increase bank margins to cover higher levels of market interest rate volatility and modify the price of interest rates to account for the rising uncertainty of the interest rate environment. Contrary to the findings of [Cruz-García and Fernández de Guevara \(2019\)](#), this study reveals an insignificant relationship between the HHI and the cost of intermediation. In consistent with the research conducted by [Boamah et al. \(2023\)](#), the present analysis also reveals a statistically significant inverse correlation between GDP and the cost of intermediation. The findings of the regression analysis indicate that a decrease in bank margins has a beneficial effect on the lending activities carried out by banks, leading to an increase in economic growth. Higher GDP growth typically leads to improved economic conditions, reducing the perceived risk of lending. As economic growth increases, businesses and consumers are generally more financially stable and capable of repaying loans, thereby reducing the risk premiums banks need to charge. This reduction in risk premiums contributes to lower bank margins. Furthermore, higher GDP growth can increase competition among banks for lending opportunities, further driving down margins. Consequently, intermediation costs decrease, facilitating more lending and stimulating further economic growth. In contrast, a positive correlation exists between inflation and the cost of intermediation, as supported by the findings of [Yakubu and Bunyaminu \(2023\)](#). The findings of this research indicate a strong correlation between rising inflation and interest rates on loans, which leads to high intermediation costs.

## 5. Robustness

This paper includes measuring the index of activity restrictions for the robustness test. This paper followed previous research that included the index of activity restriction. The constraints imposed on bank activities indicate the degree to which banks place restrictions on companies such as securities, insurance and real estate, as well as restrictions on their ownership and control of nonfinancial entities.

[Table 3](#) presents empirical findings about the impact of limitations imposed on bank activities on the cost of intermediation within the ASEAN banking system. The findings align with prior studies by [Chortareas et al. \(2012\)](#) and [Poghosyan \(2013\)](#), indicating a statistically significant positive correlation. The results suggest that restrictions on the scope of activities that banks can participate in within the ASEAN banking system may lead to a decrease in the cost of intermediation. One probable explanation is that banks, due to having

**Table 3.** Robustness: GMM estimations of the impact of restrictions on banks activity on cost of intermediation

	(1) COI	(2) COI	(3) COI	(4) COI	(5) COI
L. COI	0.7685*** (0.000)	0.7701*** (0.000)	0.7778*** (0.000)	0.7623*** (0.000)	0.7801*** (0.000)
<i>Bank specific indicators</i>					
Banks' size	0.1159*** (0.000)	0.1401*** (0.000)	0.0696*** (0.010)	0.4823*** (0.000)	-0.1188*** (0.000)
Risk aversion	0.0500*** (0.000)	0.0527*** (0.000)	0.0475*** (0.000)	0.0781*** (0.000)	0.0044*** (0.009)
Quality of management	-0.0001*** (0.000)	-0.0001*** (0.004)	-0.0001*** (0.000)	-0.0001*** (0.000)	-0.0002*** (0.000)
Liquidity	0.0064*** (0.000)	0.0080*** (0.000)	-0.0045*** (0.000)	0.0046*** (0.010)	-0.0008 (0.610)
Credit risk	0.0231*** (0.000)	0.0252*** (0.000)	0.0236*** (0.000)	0.0268*** (0.000)	0.0167*** (0.000)
<i>Industry-specific indicator</i>					
HHI index		0.0026 (0.293)	0.0004 (0.818)	0.0003 (0.856)	0.0005 (0.473)
<i>Macroeconomic variables</i>					
GDP			0.0047** (0.039)	0.0431*** (0.000)	0.0421*** (0.000)
Inflation			0.0610*** (0.000)	-0.0326*** (0.000)	-0.0247*** (0.000)
Interest rate risk				0.1259*** (0.000)	0.0113* (0.050)
<i>Regulations factor: Activity restriction</i>					
Activity restriction					0.2950*** (0.000)
_cons	-2.6505*** (0.000)	-3.1010*** (0.000)	-2.1947*** (0.000)	-7.6836*** (0.000)	-0.1882 (0.558)
N	1,278	1,278	1,278	1,247	1,247
No of groups	130.0000	130.0000	130.0000	130.0000	130.0000
Hansen test	93.1310	91.9622	98.3056	100.8833	100.7706
(p-value)	0.2561	0.2588	0.1362	0.0885	0.1025
AR(1)	-2.6270	-2.5886	-2.6492	-2.5579	-2.6373
(p-value)	0.0086	0.0096	0.0081	0.0105	0.0084
AR(2)	0.5247	0.4665	0.4718	0.5614	0.9576
(p-value)	0.5998	0.6408	0.6370	0.5745	0.3383
No of instrument	92.0000	92.0000	94.0000	94.0000	96.0000

**Source:** Authors' own work

fewer restrictions on their operations, can expand their sources of revenue beyond conventional banking activities, thus diversifying their income streams. Diversification enables banks to produce income from various sources, decreasing their reliance on imposing elevated charges on consumers to provide services.

Second, this study used a fixed effect model, which is a method for analyzing panel data over time, to check the consistency of the results. [Table 4](#) shows that three activity restriction variables — securities, real estate and ownership – significantly affected the cost of intermediation. This means that changes in these activities were strongly linked to changes in banks' costs when providing financial services.

However, there were some mixed results. For example, securities and real estate activities had results that were opposite to what had been found using the GMM regression. Specifically, the fixed effect model showed that securities activities had a significantly negative impact on the cost of intermediation, meaning that when banks were involved in securities activities, the costs of providing financial services went down. Similarly, there was a negative relationship between real estate activities and the cost of intermediation, indicating that more involvement in real estate also reduced these costs.

In contrast, the GMM regression results indicated a positive association between securities and real estate activities with the cost of intermediation. This means that the GMM model suggested that when banks engaged in these activities, the costs of providing financial services increased. The contradictory results could be due to the nature of the model. The GMM model is dynamic, considering the possibility that past values of the dependent variable (cost of intermediation) can influence its current values ([Li et al., 2021](#)). This dynamic nature can capture more complex relationships between variables. The fixed effect model, being static, does not account for such dynamic relationships, potentially leading to different outcomes.

## 6. Conclusion

In conclusion, this paper analyzes the relationship between various components of activity restrictions and the cost of intermediation within the ASEAN banking system. Notably, the results reveal that fewer restrictions on securities, insurance and real estate activities mitigate the cost of intermediation, thus enhancing the banking sector's effectiveness. The findings suggest that strict restrictions on banks' actions may decrease diversification opportunities, potentially weakening banks and increasing risk-taking behavior, which leads to higher costs charged to customers, thereby increasing the cost of intermediation. In other words, enabling a broad range of activities will facilitate income diversification, ultimately leading to more stable banks that can maintain competitive intermediation costs without needing higher consumer charges. Therefore, regulators and policymakers should consider allowing banks to engage in various activities. This approach facilitates income source diversification within banks, enabling them to generate revenue through a broader spectrum of services beyond traditional banking activities and interest-based income. This diversification of income sources can improve banking sector efficiency while reducing the risk of excessive dependence on a single income source; thus, banks would not have to charge higher costs to customers.

Moreover, regulators could make appropriate regulatory changes to help banks reduce intermediation costs while still enhancing their efficiency. For instance, when regulatory changes encourage competition by easing constraints on banking and nonfinancial activities and ownership, it can stimulate a more competitive environment. Banks and nonfinancial firms are more inclined to compete for customers' business by offering better terms and



**Table 4.** Robustness: Fixed effect estimations of the impact of restrictions on banks activity on cost of intermediation

	(1) COI	(2) COI	(3) COI	(4) COI
<i>Bank specific indicators</i>				
Banks' size	-0.3065*** (0.001)	-0.3065*** (0.001)	-0.2985*** (0.001)	-0.3155*** (0.000)
Risk aversion	-0.0022 (0.755)	-0.0022 (0.755)	-0.0023 (0.747)	-0.0033 (0.634)
Quality of management	-0.0001 (0.466)	-0.0001 (0.466)	-0.0001 (0.457)	-0.0001 (0.454)
Liquidity	0.0055 (0.383)	0.0055 (0.383)	0.0077 (0.220)	0.0063 (0.314)
Credit risk	0.0099 (0.100)	0.0099 (0.100)	0.0098 (0.106)	0.0095 (0.115)
<i>Industry-specific indicator</i>				
HHI index	0.0027*** (0.000)	0.0027*** (0.000)	0.0028*** (0.000)	0.0027*** (0.000)
<i>Macroeconomic variables</i>				
GDP	0.0212 (0.196)	0.0212 (0.196)	0.0208 (0.204)	0.0236 (0.150)
Inflation	-0.0261 (0.444)	-0.0261 (0.444)	-0.0319 (0.349)	-0.0252 (0.459)
Interest rate risk	0.3195*** (0.000)	0.3195*** (0.000)	0.3590*** (0.000)	0.3354*** (0.000)
<i>Regulations factor: Activity restriction</i>				
Securities activity	-0.4663*** (0.050)	-0.4663*** (0.050)	0.0433 (0.855)	1.2548** (0.017)
Insurance activity				0.0042 (0.823)
Real-estate activity				-9.0683 (0.811)
Ownership				1,438
year				132.0000
_cons	0.0090 (0.632)	0.0090 (0.632)	0.0090 (0.633)	0.0749
N	-13.4240 (0.723)	-13.3498 (0.724)	-14.9737 (0.693)	
N_B	1,438	1,438	1,438	
r <sup>2</sup>	132.0000	132.0000	132.0000	
r <sup>2</sup> <sub>-0</sub>	0.0736	0.0736	0.0708	
r <sup>2</sup> <sub>-w</sub>	0.0736	0.0736	0.0708	

**Source:** Authors' own work

lower fees. This competition can result in more affordable and accessible financial services, ultimately benefiting consumers and reducing the cost of intermediation.

The implications of these findings extend beyond the banking sector to the broader economy and society. Economically, lower intermediation costs can enhance access to credit for businesses and individuals, promoting investment, consumption and overall economic growth. Socially, more affordable financial services can improve financial inclusion, providing underserved populations with better access to banking products, which can help reduce poverty and inequality. Business transformation is also a significant implication of this research. Banks can innovate and diversify their service offerings as they adapt to more flexible regulatory environments. This transformation can lead to developing of new financial products and services tailored to the evolving needs of consumers and businesses, fostering a more dynamic and resilient financial sector.

Future investigations may further enhance our understanding by exploring the transformations in the landscape during the period after the COVID-19 pandemic. The ongoing global pandemic has brought about substantial changes within the financial sector. Consequently, there is a pressing need to examine the impact of activity limits on bank operations on intermediation costs in this novel environment. Through this approach, scholars can offer perspectives better suited to the prevailing economic and financial conditions, thus providing significant help to regulators and policymakers as they navigate the complex issues arising from the pandemic. Furthermore, future research could assess how variations in regulatory frameworks influence activity restrictions and their effect on intermediation costs across ASEAN countries through comparative studies. These studies can investigate how differences in regulatory frameworks affect activity restrictions on intermediation costs. Cross-country assessments provide insights into the efficacy of various regulatory methods used by banking systems in different countries.

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