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Analyzing the profitability determinants of financial institutions: Evidence from East Asian countries

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ABSTRACT

Starting around 1960, Asia, the biggest and the most crowded place on the planet, has become wealthier compared to the rest of the world. Such growth and development definitely have not happened to other countries at a similar speed all around the continent. The western region of Asia has developed at a similar pace as the remainder of the world. However, the eastern region has grown to an unmatched level. With this in mind, this study aims to investigate the factors that determine and influence the profitability of the financial institution in East Asia. Panel data of eight East Asian countries were selected for the time frame between 2002 to 2021. Analysis of various factors that play an important role in altering the financial institution's profitability level was performed. These factors include the net interest margin, capital total assets, cost to income, non-performing loans, bank stability, the gross domestic product, and liquidity. The results displayed distinctive values. First, factors such as capital total assets, the stability of the bank, and gross domestic product revealed a significant influence on the net interest margin. Additionally, liquidity, the cost of income, non-performing loans, and the gross domestic product presented a decrease in the level of net interest margin. This is acceptable for the liquidity and non-performing loans since they have an inverse relationship with the net interest margin. On the other hand, a 1% increase in the capital total asset and the stability of the bank has enlarged the net interest margin by 0.05% and 0.04% successively. Hence, the results of this study may be valuable for other countries to consider in efforts to reshape their financial sector and monetary efficiency. The discoveries may also contribute significantly to the existing literature in this area since there is limited investigation concerning the East Asian region's financial sector.

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1. Introduction

The East Asian nations had been massively fruitful in achieving quick expansion in the financial sector before the 1997 crisis. They displayed various contortions to a fluctuating degree, and with significant contrasts from one country to another. These features played a significant part in preventing suffering during the crisis (Vidhya et al., 2022). A large number of east Asian nations embraced underlying and institutional changes, along with various policies in order to manage these deformities as the result of the crisis. This was evident when the banking area was restricted in which protectionism was applied. Consequently, the capital market of east Asia has developed quickly following the crisis. Henceforth, a large portion of most countries' financial framework was no longer influenced by the banking sector as observed in the special cases of Singapore and Hong Kong (Ghosh, 2006).

The institutional framework has an extensive path to go. Restrictions commonly concern investor security, lender privileges, capital record progression, administrative limit, lawful frameworks, and the absence of credit score offices. In view of these, the administration at different levels of the government, monetary foundations, and companies have developed but compared with the remainder of the world, they stay a long way behind (Blanchard, 2005). Besides, noticing the quick development of crossline financial liabilities, it is not evident if these reserves foreign exchange reserves are overindulgent, with a couple of special cases. Policymakers perceive these reserves as an assurance against speculative assaults. However, the worth of this assurance may be overstated (Kramer, 2006).

The liberalization of the capital account is not totally complete in the east Asian region. Caution in this area is largely determined by the discernment that exchange rates are permitted to drift unreservedly when exports are viewed as the driver of development. After the crisis, the East Asian nations collected a huge sum of foreign exchange reserves (Kumar et al., 2021).

East Asian nations encounter two potential ways in dealing with foreign exchange reserves. The first method is to finish the advancement of their capital records by laying out full convertibility on the account of China which would need to permit their trade rates to drift reasonably and freely. Meanwhile, the second method is to concentrate on the adjustment of the exchange rate (Kumar et al., 2022). An appealing arrangement is for each country to restrict adaptability compared with its own bushel. The two goals can together be sought after assuming that the scope of permitted fluctuation is broad, potentially with fluffy cut-off points (Umamaheswari et al., 2022). How well banks can employ assets from their primary business mode and generate revenue continues to be the key factor of financial performance. This period serves as a general indicator of an institution's overall financial standing over a specific amount of time and can be utilized to compare similar businesses within the same industry or to analyze alternative firms or sectors (Saini et al., 2017). Control activities are a set of procedures implemented by banks to guarantee the accuracy of financial and accounting data, achieve operational and financial goals, and disseminate development strategies across the entire institution (Mishchenko et al., 2021). The rectification in the financial industry has been moderately unobtrusive. In various nations, banks were little, frequently family-claimed, and along these lines, are not exposed to investor investigation (Turner, 2007). East Asian nations witnessed their homegrown market shares being monopolized by foreign institutions, besides leisurely, mirroring the disappointment of East Asian banks to move out of customary deposit-taking and loaning organizations into the capital market administrations, protection, and other new lines of business (Goldstein, & Turner, 2004).

A required consolidation is by applying mergers and acquisitions. States can promote the cycle through capital necessities and tighter guidelines and administration (Putri et al., 2019). The banks in East Asia have a slow progress toward universalizing. Generally, on the grounds that numerous East Asian nations' frameworks actually stick to a rule that isolates banking from the securities business and insurance, home predisposition, therefore, is a huge advantage in commercial banking (Lu & Boateng, 2018). Meanwhile, Chinn and Ito (2008) contented that with the exception of Japanese banks, a large portion of East Asian financial institutions has restricted admittance to worldwide capital business sectors. This is expected

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generally because of the little size, low FICO assessments, and the lack of knowledge in global corporate banking. These financial institutions additionally have a few local office networks in East Asia itself due to section limitations in numerous nations. Overall, their client base is bound to be home-based borrowers and banks.

During the years 1997 and 2005, besides the Philippines, the magnitude of the financial area estimated by the number of bank resources, values, and bonds as an extent of the Gross domestic product at the midpoint had dramatically increased in many nations (Ghosh, 2006). The development of the financial area has been remarkable, yet it has been overtaken by the noteworthy extension of resources in both value and security markets. The size of the value market in the two most monetarily modern economies namely Hong Kong and Singapore, as well as Indonesia has dramatically increased. The financial framework in East Asia has always been a complex system investigated by a few authors. Most papers only focus on the profitability determinant of industrial and commercial firms, thus excluding the financial institutions which has also compromised the assurance enterprises. In addition to that, the authors have also mainly investigated the profitability determinant of banks in specific geographic locations such as Sub-Saharan Africa and the European Union, which resulted in inadequate focus on East Asia's financial framework. Consequently, the purpose of this study is to satisfy the long-ignored East Asia financial system. It primarily aims to address the factors that determine and influence the profitability of financial institutions in that particular location, by assessing aspects from internal and external views, such as revenue, total asset, GDP, and the region's market stability. The findings will be crucial for the region to recognize the factors that shape the financial institutions, as well as the structure of the banking industry.

With this in mind, we consider the profitability of the financial institution as the main variable which is the bank's net interest margin that is generated from the interest paid and the return on investment. Additionally, explanatory factors such as the capital total asset, cost to income, non-performing loans, bank's stability, gross domestic product in the marketplace and liquidity were selected in order to determine their influences on the financial institution's profitability. The research sample consists of eight East Asian countries (Japan, Philippines, Thailand, Malaysia, Indonesia, South Korea, Vietnam, and Singapore) for the time frame between 2002 to 2021, and the estimation analysis of panel data was employed in this study. The model displayed distinctive results across the variables in relation to profitability (net interest margin). First, factors such as capital total assets, the stability of the bank, and gross domestic product revealed a significant influence on the net interest margin. Additionally, liquidity, the cost of income, non-performing loans, and the gross domestic product presented a decrease in the level of net interest margin. This is acceptable for the liquidity and non-performing loans since they got an inverse relationship with the net interest margin. On the other hand, a 1% increase in the capital total asset and the stability of the bank enlarge the net interest margin by 0.05% and 0.04% successively.

This paper is organized in the following structure. In section 1, the paper and objectives are introduced. In section 2, previous literature on the topic is reviewed, while section 3 presents the methodology of this study. The findings are discussed in section 4, and finally, section 5 highlights the conclusion drawn from the findings in this study.

2. Literature Review

2.1 The net interest margins

The connection that exists between the controlling procedure and net interest margin has long been highlighted in some of the preliminary investigations of net interest margin. In an original evidence, Ho and Saunders (1981) presented that the presence of the interesting edge was the consequence of the exchange's unpredictability encountered by the bank. Additionally, they relied upon four different variables: the level of administrative hazard avoidance; the size of exchanges attempted by the bank; the market structure in which a given bank needed to work; and the difference in loan fees. Commercial banks

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are among the economic players that play a fundamental part in the economy of a country, particularly for a nation whose economic performance still relies on the presence of financial institutions as a vital source of supporting economic activities. At the large-scale financial level, the bank is among the actors to carry monetary-related strategy (communication belt), while at the microeconomic stage, the financial institutions are a significant source of funding for organizations and people (Daft, 2000).

Net interest edge assessment is an approach to estimating the expense of monetary intermediation, specifically the distinction between the expense of revenue paid by the borrower to the bank, as well as the interest paid to depositors (Brock & Suarez, 2000). Indicators of interest margin can be made sense by utilizing two methodologies, specifically the customary methodology and the current methodology. The conventional methodology perspectives on the factors that influence the net interest edge are measured by examining the balance sheet, while the actual approach is by considering the demand and supply amount in light of the microscopic structure of the bank (Chowdhury et al., 2016).

GDP growth and rising prices have a positive relationship with the cost of borrowing on loans. When there is no alternative to loans, better economic conditions encourage banks to raise lending rates as the number of viable ventures rises, and consequently, does the need for credit. Conversely, a rise in exchange rates, due to a consumer price estimate that is higher than the target value, makes it more appealing to participate in uncertainty securities that serve as an alternative to keeping savings, which reduces demand for deposits and raises deposit interest rates (Boateng, 2018). Consequently, the degree of effectiveness and profitability have improved, and this can be observed from the amount of capital possessed which indicates the stability of financial institutions from year to year. Hence, the banking industry needs to have enough capital to maintain a degree of financial stability in the economy which can be accomplished with a high level of profitability. Because of their ability to lessen or strengthen the effects of financial shocks on the actual economy, banks are evaluated according to their health, as the present global financial crisis has demonstrated (Abdulhakim, 2019). In other words, when evaluating the sustainability of the banking industry, a healthy rate of bank profitability is crucial. Moreover, a significant profit margin will also represent the health of the bank (Agoraki, & Kouretas, 2019).

The net margin of interest can be used to assess the degree of profitability for the banking industry (Junge & Kugler, 2018). The net profit margin is used to determine how much interest is paid to customers who deposit money with the bank as opposed to how much interest is earned from loans. The size and dynamics of both the gross interest margin will show how effectively financial intermediation is working (Khalil & Farooq, 2019). According to An and Loan (2017), a net interest margin is a tool for assessing efficiency and profitability as a fundamental indication since it provides bank income at a rate of 70% to 80% of bank revenue. As a result, the greater this ratio, the higher the bank's income would be.

2.2 The capital total asset

As per traditional corporate finance speculation, a bank in harmony will want to hold an exclusive ideal degree of capital that simply compromises expenses and profits, inferring no relationship at the margin. Nevertheless, the capital needed is forced by controllers, on the off chance that they are restricting and forcing banks to hold capital in the abundance of their private ideal, and consequently enforce banks over their inner optimal capital proportion (Miller, 1995). The impacts of market regulations compel the financial institutions to restrict their leverage, taking into consideration that financial backers are delicate to the default chance of the bank, inferring that a bank with an elevated likelihood of trouble might be rebuffed with a generally significant expense of uninsured financing (Nier & Baumann, 2006).

The constructive outcome on capital proportions of market discipline from liability possessors might be enforced by the motivating initiatives of the bank's proprietors or potentially, chiefs. The banks' decisions on capital proportion may rely upon their strategies. Saving money with hostile business plans that are pointing towards acquiring market share might use up the money quickly and subsequently resulted in having a lower capital proportion (Flannery & Rangan, 2008). A bank that intends to secure another bank might probably have a reason to keep a higher capital proportion, for instance, so it can please the

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controllers that the outcomes element will be sufficiently capitalized. An institution that is expanding its portion of the overall industry might maintain a lower capital proportion steady with a higher gamble plan or essentially on the grounds that credit development runs in front of the capacity to raise or hold capital (Goddard et al., 2004).

Total Asset Turnover is commonly known as the capital total asset (Siregar & Harahap, 2021). This ratio evaluates the efficiency of a company in using its assets to generate revenue. Total Assets Turnover is calculated by expanding business capital (operational component cycle) and trying to reach a specific level by maximizing sales. When sales have decreased to a specific level, every effort will be made to minimize operating assets. Total capital displays the fund's rotation in comparison to other companies, or, alternatively, the extent to which all assets can generate revenue. Because assets are used efficiently to generate sales, a greater ratio of total asset turnover indicates better financial performance because large profits are also generated as a result (Yusnandar, 2019).

2.3 Non-performing loans

There are numerous inward and outside factors that make a credit turn non-performing. Gambles that come from non-performing advances generally generate themselves in outer financial advancements like the financial downturn. Policymakers who attempt to settle the financial system consider non-performing loans a predominant issue in the monetary framework and the macroeconomy. The Non-Performing Advances proportion comes to the very front as the estimation of credit hazard and resource quality for the financial industry (Kingu et al., 2018). Those loans are initial measurements for the dangers such as diminished future incomes of banks, span issues that might arise between the receivables and liabilities with late assortment and the inflated costs that come from the assortment of receivables through lawful means (Akter & Roy, 2017).

Expansions in the non-performing advances proportion influence the liquidity of financial institutions negatively and frequently are accompanied by failures. Likewise, the nonperforming loans ratio is a resource quality pointer demonstrating the earnings-producing nature of the advances detailed in the resources of the bank (Christaria & Kurnia, 2016). As observed in the year 1996 to 1999, the Taiwanese's relations between bank scope and the non-performing loans were pessimistic. Non-performing advances diminished in proportion to the expansion in the public share in the bank, and non-performing credits likewise diminished following the liberation (Rajha, 2016).

Isik and Bolat (2016), in their review, have detailed that the non-performing loan proportion, net interest edge, capital sufficiency, and dissolvability proportion had negative influences on the non-performing advances of financial institutions in the past period in Turkey (2002-2014). It was additionally tracked down in the very paper that high credit development diminished the non-performing advance rates; and the writing results showed that there were areas of strength between factors like capital sufficiency proportion, the non-performing advance proportion of the preceding year, return on value, and non-performing credits, and furthermore, bank productivity diminished non-performing advance rates.

Authors such as Budhathoki et al. (2020) analyzed different financial institutions that impacted the non-performing loans in Indonesia and reasoned that the high productivity of banks has resulted in fewer non-performing loans because of their efficient propelling movement and successful credit management framework. Meanwhile, a panel data of yearly reports from 2013 to 2017 that involved a board of 35 recorded business banks in the Euro-Mediterranean area indicated that there was an adverse consequence of non-performing loans on risk on equity, demonstrating that risky credits negatively influence recorded business banks' benefit in the Euro-Mediterranean vicinity (Psaila et al., 2019).

2.4 The net income

The usual meaning of cost to income is non-premium expenses, ruling out the terrible and suspicious obligation cost, divided by the absolute of net interest earnings and non-interest earnings. Albeit the

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proportion is subjected to figures for both expense and pay, its utilization will concentrate on cost (Tripe, 1996). Non-premium expenses which are the non-interest rates costs are seen as that piece of a financial institution's costs that are most manageable, and generally receptive to the board activity. A decrease in costs, for a fixed rate of income, ought to prompt expanded benefit, and consequently expanded return on value and share value, the proportions of the most prominent premium to financial backers in bank shares (Toevs & Zizka, 1994).

The cost-to-income ratio is a proportion that does not only influence banks' costs but simultaneously the variation of the incomes. For some random degree of the cost is compared with a bank's resources, and a decrease in income will make an expansion in the cost-to-income ratio. This decrease in income may be an impression of a bank's inefficiency in creating income, yet it might likewise be an impression of a change in serious circumstances, lessening the ratio accessible to banks. A decline in income may additionally mirror an economic recession, diminishing banks' chances to attempt beneficial business from which to procure interest and expenses.

The net income of financial institutions is composed by many items. First, we have the interest rate which typically consists of income from assets that carry interest, fees from lending activities, and dividend income from shares and participations. In rare circumstances, it might also contain bond income, which is determined by subtracting the bond's book value from its redemption value. Other instruments financial institutions employ to generate net income are the commissions collected and disbursed in connection with payments services, securities transactions, and associated costs (new issues, selling, and asset allocation) as well as foreign currency transactions carried out in the name of the bank and on behalf of customers. There may also be additional earnings and expenses related to one-off transactions that are not part of routine banking operations. Realized gains and losses from securities transactions and foreign exchange activities are typically included as well (Altavilla et al., 2018).

Banks use short-term obligations which have varied levels of stability to finance long-term assets. Due to their strong propensity to be extended and the low inflation of the so-known residual sums that are kept in current accounts, private deposits are those with the highest level of stability. While there is typically some degree of specialization, financial institutions, like other businesses, generally strive to lower potential hazards by diversifying across multiple business areas (Claessens et al., 2018). In recent decades, financial institutions have started to invest more and more in businesses that generate non-interest income, or ventures that generate fees as opposed to interest. Some banks have historically focused on fee-earning services, such as providing capital-raising advice, for example, merchant banks in the United Kingdom (Hoffmann et al., 2019).

The trustee industry is an excellent demonstration of the fee income that all banks have historically generated. The old fee-earning sector made only a minor portion of most banks' profits and was unquestionably little impacted by external variables like economic swings (Lopez et al., 2018). However, as the performance of traditional banking operations has been threatened in recent years for a variety of reasons, fee-earning activities have significantly expanded their allocation to bank profits. While interest rate changes and economic cycles have a significant impact on banks' net interest margins, fee income offers greater stability and diversification for bank earnings. In such cases, it naturally follows that combining interest and non-interest income will lessen profit volatility (Tan, 2019). The increased revenues from new business units have significantly improved financial institutions' performance, according to several empirical studies. These studies discovered that a significant share of joint financial assets managed relative to total assets of bank holding companies over the period 1987–94 was associated with substantially increased profitability for bank holding companies and also with risk reduction (Holton & d'Acri, 2018).

2.5 The GDP impact on the financial institution

The necessity to invigorate and oversee economic growth is a worldwide subject in developed, arising, and less-developed nations. While the topic is not contemporary, given the proceeded populace

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development in less developed nations and the changing segment and enlarging income differences in large numbers of the most progressive economies, the dilemma of economic development has taken on expanded significance. Economists such as Patrick (1966) observed that the best economic aspects gravitate to be ones that created sophisticated and complex financial frameworks at the beginning phase. Financial institution improvement (FSD) can assume either the main part in economic development or it might play a more uninvolved job because of growing economic aspect needs.

Finance and economic expansion have long been a topic of discussion, along with early theoretical work, which emphasizes the role of financial development in fostering economic growth and reinforces the idea that financial sector development is a reliable indicator of economic growth. Information gathering, corporate governance, risk management, exchange facilitation, and savings mobilization are some of these duties. Therefore, it is proposed that financial development fosters economic expansion through the different services that financial systems offer (Sharma & Bardhan, 2017). However, because financial systems include both markets and intermediaries, it is unclear who executes the functions more effectively. This sparked the debate over whether the financial system should be based on banks or markets (Fu et al., 2022).

The disparities in the effectiveness of financial structures on economic growth, however, indicate that there may be more variables that can influence this relationship, such as the nation's institutional development. For instance, new evidence supports the development of stock markets, especially in highly developed nations with sound institutions (Malik et al., 2020). Additionally, it is said that developed economies benefit more from market-based financial systems than less developed ones, where bank-based financial systems have a greater impact on growth because of a lack of access to credit (Zhou, 2018).

However, in order to achieve financial development and integration, liberalization policies must be viable and capable of reducing the dangers of credit booms and unstable capital flows. Building strong institutions should be a priority for nations because they may be more susceptible to the risks of capital account liberalization. A more transparent economy draws higher levels of foreign direct investment, which is an interesting way that strong financial institutions can encourage transparency. This has a positive feedback effect on economic growth (Cerutti et al., 2019).

The previous worldwide financial crisis exhibited areas of a strong connection between the real economy of the European sovereign debt and the financial sector as referenced by Fan (2016). Monetary security objectives and financial industry arrangements have been integrated into macro hypotheses with money-related strategies because of the worldwide financial emergencies. The significant channel includes the utilization of its loan cost device by the central bank to battle a credit blast or different signs of bank defeat (Woodford, 2012). A colossal dataset to show how free financial circumstances have advanced land loaning and home cost increased previously, especially in the post-war time (Chwieroth & Walter, 2020).

National banks, mindful specialists, and private enterprises have directed and screened these areas to guarantee the smooth activity of the installment plot between financial firms. Financial vulnerability might result from issues with the board or the installment strategy. For banks in the US and universally, previous research on the connection between bank size and steadiness has delivered ambiguous ends (Beck et al., 2009). A few investigations have discovered that global banks have differing suggestions for the steadiness of developing financial areas, especially during seasons of monetary emergency. Some global banks that foster new items through Greenfield exercises face more contests in the domestic country and, accordingly, lower profits (Goldberg, 2004).

2.6 Liquidity utilization

Over late years, financial institutions turned out to be progressively complicated foundations, being presented with an interweaved set of dangers. The 2008 financial crisis gave an excruciating delineation of how extreme these crises can be and how they can significantly influence the real economy. Despite how complicated financial institutions have turned out to be, and where there is a natural risk that exists

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somewhere down in their center capability, banks are exceptional because of their extraordinary intermediation job. They award credits to business people and buyers, furnishing them with vital liquidity to fund their speculation and utilization needs.

Nonetheless, financial institutions utilize only their very own restricted assets to acquire financing. Capital prerequisites on dangerous assets comprise a limiting imperative for the base measure of own assets required. A large portion of the assets utilized by banks is related to liabilities to outsiders. Generally, these liabilities would appear as depositors. These fluid liquid declaration permit client to intertemporally upgrade their utilization inclinations (Diamond & Dybvig, 1983). The expanded dependence on discount financing makes the connection between subsidizing and market liquidity risk a lot more grounded, as examined by Brunnermeier and Pedersen (2009). Considering this, despite the fact that banks are the fundamental suppliers of liquidity to the economy, they need to satisfactorily deal with the liquidity risk by invoicing their accounting report structure, as their development change capability makes them innately illiquid (Berger & Bouwman, 2009).

Regulations have shifted to place more importance in moderating a portion of liquidity risk. One explanation for the need to manage liquidity risk is connected with the way that banks do not consider the social ideal when they improve the connection between risk and return. Nonetheless, a bank's defeat might comprise a broad externality on other banks and, at last, all in all, the economy. This risk is aggravated by the reality that liquidity disturbances are occasions with an extremely low likelihood. Allen and Gale (2004) demonstrated that liquidity risk balancing is important when monetary business sectors are inadequate, but underscoring that all mediations definitely create disruptions.

Besides, Rochet (2008) contends that banks face unreasonable challenges when assuming a high probability of being rescued if there should be an occurrence of a risk. Customarily, reserve necessities on bank deposits were the primary device for liquidity risk regulation and management. However, they likewise play a significant job in the execution of financial arrangements (Robitaille, 2011). More significantly, deposit assurance is at this point extensively perceived as a significant apparatus in forestalling investors' bank operations.

Worldwide, liquidity risk guideline was perhaps fairly neglected before the worldwide financial crisis with nearly non-existent globally fit rules. In any case, the part by financing liquidity during the worldwide financial emergency clarified that another global administrative structure was needed. In December 2010, the Basel Council unveiled the last rendition of the global structure for liquidity risk guidelines, which is a significant piece of the new Basel III administrative bundle. An investigation of asset report construction can give a significant knowledge of financial institution liquidity risk. All the more explicitly, the proportion between credit conceded and deposits taken from clients gives an expansive primary portrayal of banks' fundamental financing risks, considering that clients' deposits are a comprehensively steady money source (Afonso et al., 2011).

2.7 Stabilizing the financial sector by promoting the financial inclusion

The financial industry is viewed as a significant part of the economic framework. This sector can facilitate capital deployment for expanded-yielding ventures through monetary intermediation procedures and can guarantee the productive distribution of monetary assets among borrowers and banks. As described by Babar et al. (2019), financial stability is accomplished when the monetary framework works proficiently and actually without interference, and the financial hazard is estimated and adequately controlled to limit the effect of foundational emergencies. Additionally, economies all over the planet endeavor to expand monetary incorporation (financial inclusion) as a component of their procedure to foster the monetary and economic areas by giving entry to financial administrations (Morgan & Pontines, 2018).

Financial inclusion implies that each grown-up in the populace has a gain to monetary services at reasonable expenses and in relevance to their needs (Le et al., 2019). To guarantee financial stability in a region, the intermediation cycle should continue without an obstacle. Financial stability is affected by a few

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wide factors, like infrastructure, capital sector, and financial institutions. The general foundation incorporates a financial regulatory structure, an overall set of laws, monitoring, and oversight. As a general rule, states are quick to deal with the financial framework by limiting potential dangers, executing financial related arrangements, and overseeing financial institution stability (Schinasi, 2004). Subsequently, nations have a stake and a definitive obligation in keeping up with financial stability through their compelling administration.

To put it plainly, states oversee financial stability in a nation through its strategies, guidelines, and execution inside a sound administration framework. Generally, financial stability could probably be impacted by a nation's good governance. Besides, the absence of admittance to finance encountered by the less privileged fragment of the populace, which doesn't have any method for saving and venture, adversely affects poverty mitigation and economic development (Neaime & Gaysset, 2018).

3. Methodology

3.1 Data collection

The point of this paper is to assess the various factors that influence the financial institution's profitability which is the net interest margin of East Asian countries. All the data were gathered from the world bank data, especially from the global financial development indicator. Additionally, a well-balanced panel of data consisting of eight East Asian countries, which included Japan, Philippines, Thailand, Malaysia, Indonesia, South Korea, Vietnam, and Singapore from the time 2002 until 2021, was utilized for the empirical analysis. Moreover, in this paper, the bank's net interest margin which stands for profitability was used as a dependent variable. While factors such as the capital total assets, the cost to income, non-performing loans, the bank's stability, gross domestic product in the marketplace and liquidity were used as explanatory factors to determine the financial institution's profitability.

Table 1. Variable summary

Variable	Description	Data source
Years	20 years	From 2002 until 2021
Countries	8 East Asian countries	
NIM	Bank Net Interest Margin	
BCTA	Bank Capital Total Asset	
BCI	Bank Cost to Income	World Bank Data especially from global financial development.
NPL	Bank non-performing loans to gross loans	
ZSCORE	Bank stability	
LGDP	Gross domestic product in percentage	
LID	Liquid asset to deposit	

3.2 Statistical method

In this section, the method used in the study was longitudinal panel data composed of generalized least squares, fixed effect model, and random effect model to estimate the variables. The equations below describe the structure of the different models. Supposing that the NIM is considered as the dependent variable while BCTA, BCI, NPL, Z-score, LGDP, and LID are regarded as the explanatory variables.

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3.2.1 Generalized least squares

$$Y_{it} = \beta_0 + \beta_1 x_{it} + \beta_2 x_{it} + \cdots + \beta_n x_{it} + u_{it} \quad (1)$$

$$\frac{Y_{it}}{\sigma_i} = \beta_0 \frac{1}{\sigma_i} + \beta_1 \frac{x_{it}}{\sigma_i} + \beta_2 \frac{x_{it}}{\sigma_i} + \cdots + \beta_n \frac{x_{it}}{\sigma_i} + \frac{u_{it}}{\sigma_i} \quad (2)$$

$$\frac{Y_{it}}{\sigma_i} = \beta_0 \frac{1}{\sigma_i} + \beta_1 \frac{BCTA_{it}}{\sigma_i} + \beta_2 \frac{BCI_{it}}{\sigma_i} + \beta_3 \frac{NPL_{it}}{\sigma_i} + \beta_4 \frac{Zscore_{it}}{\sigma_i} + \beta_5 \frac{LGDP_{it}}{\sigma_i} + \beta_6 \frac{LID_{it}}{\sigma_i} + \cdots + \beta_n \frac{x_{it}}{\sigma_i} + \frac{u_{it}}{\sigma_i} \quad (3)$$

3.2.2 Fixed effect model

$$Y_{it} = \beta_1 x_{it} + a_i + u_{it} \quad (4)$$

$$\mathrm{NIM}_{it} = \alpha_i + \beta_1 \mathrm{BCTA}_{it} + \beta_2 \mathrm{BCI}_{it} + \beta_3 NPL_{it} + \beta_4 \mathrm{Zscore}_{it} + \beta_5 \mathrm{LGDP}_{it} + \beta_6 \mathrm{LID}_{it} + \cdots + u_{it} \quad (5)$$

3.2.3 Random effect model

$$Y_{it} = \beta_1 x_{it} + a_i + u_{it} + \varepsilon_{it} \quad (6)$$

$$\mathrm{NIM}_{it} = \alpha_i + \beta_1 \mathrm{BCTA}_{it} + \beta_2 \mathrm{BCI}_{it} + \beta_3 NPL_{it} + \beta_4 \mathrm{Zscore}_{it} + \beta_5 \mathrm{LGDP}_{it} + \beta_5 \mathrm{LID}_{it} \ldots + u_{it} + \varepsilon_{it} \quad (7)$$

4. Results and discussion

In every study, descriptive statistics offer general information with the objective to sum up the investigated factors. Table 2 displays unmistakable measurements of all factors utilized in this review and introduces the mean, standard deviation, min, and max for all factors. Descriptive statistics presumed that the evidence is ordinarily disseminated, and a relapse model in light of those factors is substantial. In accordance with our data, the sample size consisted of 8 East Asian countries' financial performance during 20 years of observations from 2002 until 2021. Additionally, the GDP was converted to a percentage so the analysis of panel data would not be affected. In table 2, the results display that the net interest margin had an average of 2.9 and a standard deviation of 1.5, thus representing a stable volatility. Subsequently, the average capital total asset was 9.1, the average cost to income was 49.7, the average of non-performing loans was 3.6, the average bank's stability was15.4, GDP and liquidity presented an average of 11.5 and 24. Factors such as liquidity, the cost of income, and bank stability had a high standard deviation, and therefore, we deduced that there was presence of volatility.

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Table 2. Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
NIM	150	2.923	1.552	0.147	6.848
BCTA	139	9.108	2.335	3.3	15.632
BCI	152	49.713	9.702	20.311	73.858
NPL	144	3.621	3.874	0.236	24
Z-SCORE	153	15.425	8.797	2.803	38.58
LGDP	160	11.655	0.527	10.544	12.792
LID	152	24.023	10.968	8.182	83.386

The results of the correlation matrix, introduced in Table 3, present the degree of correlation among the factors assessed. In accordance with Gujarati (2003), multicollinearity is a factual peculiarity where at least two indicator factors are exceptionally connected in a different relapse model. The mere existence of multicollinearity can influence the precision of the factors investigated by making evaluations of the model coefficients unauthenticity and unreliability. It was also stated that correlation must not exceed 0.8 (Gujarati, 2003?). Table 4 shows the correlation results between factors. Based on the results, it can be interpreted that there was no existence of multicollinearity problem. Therefore, all the variables used in this study were maintained.

Table 3. Matrix of correlations

Variables	NIM	BCTA	BCI	NPL	Z-SCORE	LGDP	LID
NIM	1.000						
BCTA	0.690	1.000					
BCI	0.002	-0.209	1.000				
NPL	0.265	0.045	-0.029	1.000			
Z-SCORE	-0.397	-0.059	-0.254	-0.210	1.000		
LGDP	-0.327	-0.433	0.442	-0.437	-0.257	1.000	
LID	0.156	0.255	-0.303	0.013	0.204	-0.350	1.000

The findings of the Breusch-Pagan Test to identify heteroscedasticity is shown in Table 4. The findings demonstrated that net interest margin of East Asian countries p-values was at 0.0001 and significant, which implies that heteroscedasticity was present. Heteroscedasticity can be accounted for using the GLS approach (Rosenberg & Perry, 1981). This was the rationale behind using the GLS as an alternate estimating method in the study (Isa et al., 2017).

Table 4. Heteroskedasticity test

chi2(1)	15.25
Prob > chi2	0.0001

Variance inflation factors estimate the relationship among the explanatory factors in regression models. In conformity with analysts, this test expresses the presence of multicollinearity. To be precise, the more VIF rises, the less authentic and reliable the regression results will be. Mainly, a VIF over 10 demonstrates an excessive correlation and reason for worry. Most authors propose a safe degree of 2 to 4. In Table 5, all

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the variables revealed a variance of 1 to 1.5. Only the gross domestic product factor revealed a variance of 2.3. Also, the mean value of all the factors combined was 1.55 which was insignificant and low. Overall, the results presented the non-presence of multicollinearity.

Table 5. Variance inflation factor (VIF)

	VIF	1/VIF
LGDP	2.394	.418
NPL	1.592	.628
BCTA	1.406	.711
ZSCORE	1.375	.727
BCI	1.335	.749
LID	1.22	.82
Mean VIF	1.554	.

Table 6 presents the result of the Hausman specification test (1978) with a p-value that was significant which implies the option for the fixed model. As our model results showcased a critical p-value of 1%, we dismissed the null hypothesis of the non-presence of connection between observables residuals impacts and independent factors. Accordingly, the fixed model was the proper model for this study.

Table 6. Hausman specification test

	Coef.
Chi-square test value	69.23
P-value	0

Table 7 compares the results between the GLS and RE by illustrating the relationship between the net interest margin, which is the profitability realized by the financial institution, and the explanatory variables. For the GLS, the results imply that four factors affected the bank's profitability significantly, while bank cost to income and non-performing loans did not have a noteworthy effect. Nevertheless, all the variables still influenced the degree of financial institutions either positively or negatively. First of all, it was perceived that the capital total asset affected the NIM positively because a 1% increase in BCTA has increased 0.22% of the level of profitability. Next, an increase in the BCI rise of 0.01% in the profitability rate was detected, which suggests the inefficiency of East Asian banks in this model. Also, the non-performing loans which were given to the less credit-worthy customers exhibited a positive direction in proportion to the profitability since a 1% increase in NPL expanded the interest margin to 0.003%. Moreover, the z-score was used to determine the financial institution's stability. The result revealed a negative direction of 0.04% in profitability which means that East Asian banks were unstable. Additionally, the gross domestic product has been unveiled to have a negative effect of 1.2% on financial institutions during the 20 years. Finally, the liquidity presented a negative effect on NIM, indicating the possibility of East Asian banks not maintaining an adequate and acceptable rate of liquid cash. When it comes to the RE model, it was perceived to have a similar output to GLS, except when it comes to LID, there was a distinctive significance.

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Table 7. GLS VS Random effect model

Constant (NIM)	GLS	RE
BCTA	0.229***	0.207***
	(0.0454)	(0.0430)
BCI	0.0119	-0.00301
	(0.00842)	(0.0100)
NPL	0.00386	0.00936
	(0.0215)	(0.0238)
ZSCORE	-0.0446***	-0.0372**
	(0.00971)	(0.0148)
LGDP	-1.188***	-1.072***
	(0.305)	(0.340)
LID	-0.0161***	-0.0115
	(0.00614)	(0.00761)
Constant	14.89***	14.54***
	(3.673)	(4.141)
Observations	130	130
R-squared		0.516

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

After running the Hausman test, it was discovered that the fixed model was the most accurate and appropriate in interpreting the variable's impact. In this essence, Table 8 denotes the fixed effect results and it appeared non-identical to the random effect regression but still close. For instance, only three factors such as BCI, Z-score, and LGDP were distinguished to have a significant effect on NIM in the case of FE results. On the other hand, RE asserts that BCTA also has a significant impact on NIM, whereas BCI has an inconsequential impact on NIM. Furthermore, in The FE model, the cost to income (BCI) and liquidity (LID) have displayed an accurate value since these factors have an inverse relationship with the bank's profitability. For example, the BCI which signifies that the higher the ratio, the lower the profitability, presented a decrease of 0.22% in profitability whenever the BCI increased by 1% in the East Asian banks. Additionally, in this model, the liquidity is suggesting that the East Asian financial institutions maintain a high level of cash and do not invest in it which decreased the profitability level by -0.01%.

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Table 8. Random effect VS Fixed effect model

Constant (NIM)	RE	FE - (Hausman test)
BCTA	0.207***	0.0576
	(0.0430)	(0.0438)
BCI	-0.00301	-0.0220**
	(0.0100)	(0.00879)
NPL	0.00936	-0.0117
	(0.0238)	(0.0244)
ZSCORE	-0.0372**	0.0400**
	(0.0148)	(0.0174)
LGDP	-1.072***	-1.476***
	(0.340)	(0.510)
LID	-0.0115	-0.00967
	(0.00761)	(0.00672)
Constant	14.54***	20.46***
	(4.141)	(6.048)
Observations	130	130
R-squared	0.516	0.209

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

Table 9 summarizes the regression results for all the models. We noticed that the random effect was presented for extra analysis and insights. Based on the results, the BCI did not have a significant effect on the net interest margin in contrast with fixed and OLS models. Generally, the rest of the factors appeared to maintain a similar impact to other models**.**

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Table 9. Regression summary

Constant (NIM)	OLS	RE	FE
BCTA	0.413***	0.207***	0.0576
	(0.0426)	(0.0430)	(0.0438)
BCI	0.0198**	-0.00301	-0.0220**
	(0.00996)	(0.0100)	(0.00879)
NPL	0.0422	0.00936	-0.0117
	(0.0273)	(0.0238)	(0.0244)
ZSCORE	-0.0626***	-0.0372**	0.0400**
	(0.0110)	(0.0148)	(0.0174)
LGDP	-0.445*	-1.072***	-1.476***
	(0.264)	(0.340)	(0.510)
LID	0.00926	-0.0115	-0.00967
	(0.00927)	(0.00761)	(0.00672)
Constant	4.032	14.54***	20.46***
	(3.326)	(4.141)	(6.048)
Observations	130	130	130
R-squared	0.649	0.516	0.209

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

4.1 Discussion

The financial framework of the east Asian region is attracting worldwide recognition. A remarkable phenomenon was the Asian crisis where the Japanese financial industry was in a poor situation after the bubble economy. However, the sector is currently going through enormous detonation in terms of liberalization and securitization. At the same time, the recovery of the Korean and Southeast Asian economies following the Asian financial emergency anticipates the rebuilding of their financial areas.

The region's financial institutions have overtaken and improved finance-arranged monetary frameworks. In addition, the region has an important trade bloc called ASEAN which promotes the performance of the financial institutions. ABIF (ASEAN Banking Integration framework) permits banks in meeting specific standards to have more prominent admittance to other ASEAN markets and greater adaptability working there. At the same time, member states have focused on making more grounded administrative and arrangements of collaborative plans to moderate the dangers of financial risks. Full acknowledgment of ABIF (ASEAN Banking Integration framework) is probably going to prompt local financial solidification and elevate rivalry in such regions in cash management, hedging products, exchange finance, foreign trade, and banking services. Financing access will become more straightforward, particularly for little and medium-sized banks that actually wish to draw on a bigger pool of reserve funds and more profound capital in capital sectors.

The regional blocs and the various initiatives applied by the nation’s government are important factors that improved the profitability of the financial institutions. In this paper, the results revealed several noteworthy findings especially based on the fixed effect model. The profitability determinants of the financial institutions are mainly affected by factors such as the total capital asset of the bank, cost of income, the degree of the bank’s stability, gross domestic product, and the liquidity rate. As previously mentioned, an increase of 1% in BCTA, and the Z-score expanded consecutively by 0.05% and 0.04% of the financial institution’s profitability. Nevertheless, the East Asian financial institution displayed a high level of cash

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and did not invest in it which decreased the profitability level by 0.01%. Oddly, the LGDP in proportion to the financial institution profitability (NIM) presented a value of 1.47% which implies that an increase of 1% in GDP in the region decreases the net interest margin of the financial institutions. Additionally, as expected, the non-performing loans (NPL) unveiled an expansion of 1%, and a decrease of 0.12% in the net interest margin (NIM) due to the inverse relationship that exists between the two factors. Finally, an increase in cost to income has reduced the net interest margin by 0.022%.

5. Conclusion and implication

The dynamic development of various sectors in East Asian countries throughout recent years has stunned economists and has brought forward many books, articles, and studies endeavoring to make sense of the peculiarity. This study seeks to assess the profitability determinants of financial institutions in East Asian countries. For that reason, we gathered the data from world bank data of 8 East Asian countries (Japan, Philippines, Thailand, Malaysia, Indonesia, South Korea, Vietnam, and Singapore) from 2002 to 2021. Panel data was exercised to analyze the influence of factors such as net interest margin, capital total assets, the cost to income, non-performing loans, bank stability, gross domestic product, and liquidity. After running the model, we perceived that the fixed effect model was more appropriate in interpreting the results. Consequently, the findings presented that a 1% increase in both the total capital asset, and the stability of the financial institution expanded by 0.05% and 0.04% in succession as the net interest margin which is viewed as the financial institution profitability in this study. Moreover, we discovered that a 1% rise in non-performing loans and liquidity reduces 0.12% and 0.01% of the net interest margin. This implies that East Asian financial institutions maintain a high volume of cash and they do not invest in it which affects the profitability rate. Also, the non-performing loans are sold at discount rates to disqualified customers which signifies that it is unlikely to be repaid which consequently affects the East Asian financial institutions. Additionally, an increase of 1% in the cost to income has decreased the profitability level by 0.022%. Finally, the results of this paper might be valuable for other countries that wish to reshape their financial sector and monetary efficiency. The discoveries may likewise enrich the existing literature since there is limited investigation concerning the East Asian region's financial sector. Finally, identifying the main factors that influence the profitability of the financial institutions may assist the banking sector in ways to optimally maneuver them.

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Conflict of interest statement

The author declares the absence of conflicting interests.

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Authors' contributions

Sadik Aden Dirir carried out the research, wrote and revised the article.

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