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The Effect of the Human Development Index on Banking Stability in ASEAN

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RESEARCH ARTICLE

The Effect of the Human Development Index on Banking Stability in ASEAN

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Abstract: Global phenomena show that the quality of human development plays an important role in various aspects of the economy, including the stability of the banking sector. In the ASEAN region, developing countries such as Indonesia, Malaysia, Vietnam, the Philippines, and Thailand are undergoing rapid economic transformation, which can affect the dynamics of banking stability. The study aims to analyze the relationship between the Human Development Index (HDI) and banking stability in these countries, assuming that improving the quality of human development can strengthen the stability of the emerging banking sector. The study used panel data from 2000 to 2021 obtained from Our World in Data and the International Monetary Fund. The analysis technique in this study uses panel data regression, namely the fixed effect model, to capture the specific influence of HDI on banking stability in each country. The results show that the increase in HDI contributes positively to banking stability in ASEAN, which shows the importance of improving the quality of life that supports economic stability. The main contribution of this research is to provide empirical evidence on the role of HDI as an important factor in strengthening the stability of the banking sector, as well as to enrich the literature on the relationship between human development and financial stability in developing countries.

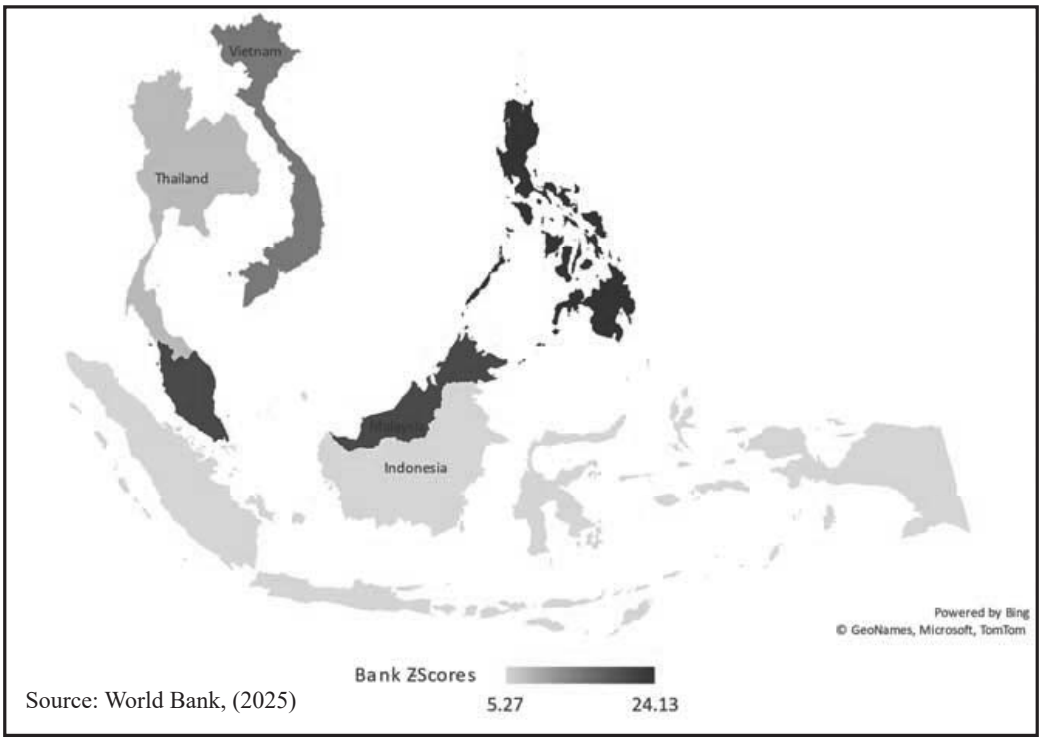
Keywords: Human Development Index, Banking Stability, ASEAN

Banking stability is an important foundation for the sustainability and health of a country's financial system. Banking stability does not have a generally agreed definition. Policymakers usually consider it to be a condition in which there is no banking crisis (Ozili, 2018). According to some sources, banking stability refers to the conditions under which banks can operate effectively and efficiently without facing systemic risks that could threaten their operations (Ellis et al., 2022). This includes the bank's ability to manage and withstand economic and financial shocks, maintain adequate liquidity, and maintain customer and investor confidence. The main indicators used to assess banking stability include capital adequacy ratio, liquidity, asset quality, profitability, and risk management effectiveness. A stable banking system is not only able to survive the financial crisis but also plays an important role in boosting economic growth (Alqahtani & Mayes, 2018). Stable banks provide funds for productive investments, support financial transaction activities, and facilitate the smooth flow of credit to various economic sectors in need.

ASEAN consists of 10 countries with different levels of economic development ("The Association of Southeast Asian Nations," 2024). ASEAN has become one of the fastest-growing regions in the world, contributing significantly to the global economy (Nguyen & Nguyen, 2018). ASEAN has managed to attract high foreign investment, increase international trade, and implement various structural reforms in an effort to strengthen its economic competitiveness. In 2022, ASEAN economies reached a nominal GDP of USD 3.6 trillion, making it the largest in Asia. ASEAN's nominal GDP per capita was recorded at USD 3.3, showing a significant increase in 2021 (ASEAN Secretariat, 2023). Economic integration initiatives through the ASEAN Economic Community (AEC) have successfully promoted policy harmonization, increased labor mobility, and strengthened intra-regional trade relations. ASEAN is dominated by countries in the developing category. In the end, developing countries recorded higher per capita incomes, more job opportunities due to increased competition among economic actors, high levels of foreign investment, and higher living standards (Batrancea et al., 2021).

ASEAN has a high banking stability health, with a bank z-score of 5.27. This is reflected in Figure 1. This high level of stability shows that banking conditions are stable and strong, and they are able to avoid potential financial crises, such as those that occurred in 2008 and the crisis caused by COVID-19. This condition reflects effective and efficient capital, liquidity, and risk management (Budnik & Bochmann, 2018). Prudent monetary and regulatory support and banking sector reforms can make banking stability work. The diversity of different economic and market structures in ASEAN makes it important to study banking stability. Developing countries in ASEAN will be able to provide efficient credit facilities, support the private sector and third parties in productive investment, and strengthen their economies in the face of national and global crises if banking stability is maintained in a healthy manner (Bhegawati & Utama, 2020).

Various studies by researchers have previously stated that many causal factors are able to affect banking stability. However, what attracts the most attention is how the level of human development reflected in HDI, measured through three dimensions, is able to affect the stability of the banking system



Source: World Bank, (2025)

Figure 1. Banking Stability in ASEAN in 2021

in developing countries. These three dimensions are health, education, and a decent standard of living (Liu et al., 2023). The increase in HDI is related to the high quality of life of the community—the condition of human resources that are able to save, invest, understand financial products, and manage their funding for productive activities. Ngouhouo and Nchofoung, (2022) said that the country, which generally has a high HDI, has a banking system that is resistant to crisis conditions and its people tend to be investment literate. In addition to the influence of HDI, various studies also analyze how the structure of financial markets, regulations such as monetary policy arrangements by central banks, and macroeconomic conditions in the region have the potential to affect banking stability. However, research on the impact of HDI on z-score banks is still not widely investigated. Various studies also mention that increasing HDI is important in supporting the SDGs, which emphasize poverty reduction and improving the quality of life as key pillars to achieve sustainable and inclusive economic growth (Halisçelik & Soytas, 2019).

Scandinavian countries tend to have high HDI, based on data that also shows high banking stability. These countries not only rank high in life satisfaction but also in social support, freedom to make life choices, and low levels of corruption (Martel et al., 2020). This contributes to better financial literacy and more efficient risk management. Research by Raza et al. (2019) supported that countries with higher HDI tend to have higher levels of financial inclusion and more stable banking systems, as more educated and healthy people are better able to manage their finances and understand the products that banks offer in supporting a decent life. However, is this relationship the same in developing countries in ASEAN, such as Indonesia, Malaysia, Vietnam, the Philippines, and Thailand? This, of course, still needs further research.

The rapid transformation in the ASEAN region has brought opportunities as well as challenges for the banking sector. In the face of global economic dynamics, banking stability is an important foundation in maintaining sustainable economic growth in developing countries such as ASEAN. One of the factors that is rarely studied but has a potential role is the quality of human development. In ASEAN, where human development disparities are still a major issue, it is important to understand how increasing HDI can have an effect on strengthening the stability of the financial system.

This study is particularly relevant because the relationship between HDI and banking stability in ASEAN developing countries has not been studied in depth. Although HDI is recognized as an important indicator in assessing human progress and quality of life, specific research exploring the impact of HDI on banking system stability in ASEAN countries is still very limited. Previous research has only focused on macroeconomic factors such as inflation, interest rates, or monetary policy in analyzing banking stability, such as in Ehigiamusoe and Samsurijan (2021), Viphindrartin et al. (2021), and Ehigiamusoe et al. (2020). In addition, previous research tends to examine global coverage or is limited to developed countries (Ullah et al., 2024; Winkler & Beck, 2021). Based on the previous literature and theory, the hypothesis of this study states that the increase in HDI will have a positive and significant effect on banking.

Using a fixed-effects model of panel data regression, the study offers a comprehensive analysis of how HDI variations affect banking stability in the ASEAN region, as well as addressing differences between countries in the region. This approach not only allows for a sharper understanding of the role of HDI in terms of financial stability but also makes a significant contribution to the literature by providing new perspectives that are important for the development of banking policy and the national economy. By presenting a more detailed and contextual analysis, this study enriches the academic literature and provides a solid basis for policymakers to formulate more effective strategies to improve the resilience of the banking system in ASEAN. In addition, this research provides a new perspective on policy development that integrates human development as a key element in strengthening the banking sector.

The rest of this study is explained as follows. In the second part, previous theories and research are discussed. The third part discusses the data and research methods. The fourth part discusses the results and discussions. The fifth section discusses conclusions.

Literature Review

Banking stability calculates the ability of the banking system to carry out its functions effectively and efficiently without significant disruption, even in volatile economic conditions and when experiencing crises

(Taskinsoy, 2020a). Banking stability is considered important because banks play a central role in the economy by carrying out intermediary functions such as distributing credit, providing liquidity, and facilitating payments or as an intermediary institution between people with excess and shortage of funds (Aramonte et al., 2021). Some studies have found that factors that can affect banking stability are bank financial health, macroeconomic environment, regulation and supervision, and public trust. A bank's financial health is measured by a variety of indicators, including capital adequacy ratio, asset quality, profitability, and liquidity. Several studies also mention that economic stability, inflation, and overall economic growth can also affect banking stability. Effective regulatory policies and supervisory functions by each country's financial authorities can also improve banking stability and public confidence in the banking system.

HDI is an indicator used to calculate or compare the level of human development. HDI was introduced by the United Nations Development Programme (UNDP, 1990) as a broader measure of human welfare compared to only using a measure of the level of welfare, namely GDP. HDI includes three dimensions of human development, namely, life expectancy at birth, education level, and standard of living (Jalil & Kamaruddin, 2018). The health dimension is measured through human life expectancy, measuring the level of health quality and health conditions. The education dimension is measured using the level of education achieved by the adult population as well as the rate at which school participation lasts, reflecting the access and quality of education available in the country. The concept of HDI emphasizes that economic development is not only about economic growth but also about comprehensively improving the quality of human life (Rahman et al., 2020).

The influence of HDI on banking stability is intertwined through several mutually supportive mechanisms. The increase in the length of time a person spends in school, as one of the components that make up the HDI value, reflects a person's investment choices, financial products, and smarter credit risk avoidance in a country. Residents with higher levels of education are considered to be able to manage their personal finances more intelligently and choose banking products that are more effective in supporting productivity, as in the study by Johan et al. (2021). Zhou et al. (2023) conducted a survey of the ranks in China and found a strong positive correlation between education and financial literacy. Various studies also mention that a person's higher education makes their life more feasible (Nixon, 2020; Gutmann, 2015). The relationship between education and wealth is also strong. A higher income makes saving easier, and saving is necessary to build wealth (Wolla & Sullivan, 2017). People will tend to save, banking liquidity will be maintained, and banks will be more resilient in dealing with economic shocks and maintaining their operational efficiency, which is often reflected in operational costs.

The HDI factor on banking stability is still minimally studied, especially in developing countries. Research by Al-Shimari et al. (2021) showed the existence of a reciprocal relationship between HDI and financial system stability. The study examined the country of Saudi Arabia and concluded that an increase in HDI tends to improve banking stability. This happens because healthier and more educated people tend to be more financially stable and avoid the risk of bad credit. Research by Banerjee (2020) examined the relationship between financial inclusion, financial stability, and human development using the populations of South Asian countries. The results of the study highlighted that financial inclusion can increase HDI. Research by Jima and Makoni (2023) using Granger's causality test revealed the existence of separate bidirectional causality and combined unidirectional causality, which showed the complementarity between the variables of financial inclusion, financial stability, and economic growth. In addition, with sufficient capital reflected in the value of the capital adequacy ratio, banks are better able to maintain operational activities without worrying about facing a crisis (Markman & Venzin, 2014).

Data and Methods

This study will examine the relationship between HDI and banking stability in the ASEAN region, namely Indonesia, Malaysia, Thailand, the Philippines, and Vietnam. These five countries were chosen because they represent countries with different stages of economic development in the ASEAN region, have dynamic market characteristics, and are included in developing countries with rapid growth. This study utilizes annual data from 2000 to 2021 obtained from Our World in Data and the IMF. The operational details of the variables used are described in Table 1.

Table 1

Variable Operations

Variable	Definition	Formula
Banking Stability (BZS)	A bank's z-score captures the likelihood of a country's commercial banking system defaulting. The Z-score compares a country's commercial banking system buffers (capitalization and yields) to the volatility of those yields.	$Z - scores = \frac{ROA + CAR}{\sigma ROA}$ ROA indicates the rate of return on assets, CAR represents the capital adequacy ratio, and σROA is the standard deviation of the total return on assets.
Human Development Index (HDI)	A summary of the average achievement measures on the main dimensions of human development, namely longevity and health, knowledge, and a decent standard of living.	First, each indicator is normalized to a scale of 0 to 1 by setting minimum and maximum values. Countries with indicator values above or below a minimum score of 0, while countries above or above a maximum score of 1. The normalization formula used is: $HDI(i) = \frac{(Actual\ x_i value - minimum\ x_i value)}{(Maximum\ x_i value - minimum\ x_i\ value)}$ Second, the indicator is combined by calculating the arithmetic mean for the educational indicator and then calculating the geometric average of the three dimensions.

Source: World Bank, (2025b); United Nations Development Programme, (2025)

This study applies panel data regression analysis to test the influence between the variables studied. The regression equation model used in this study is formulated mathematically in Equation (1), which explains the functional relationship between independent variables and dependent variables.

$$BZS_{it} = \beta_0 + \beta_1 HDI_{it} + e_{it} \quad (1)$$

where β is a constant; BZS is banking stability, which is a proxy using the bank's z-score; HDI is the human development index; i is the cross-section; t is the time series; and e is an error term.

This study will use panel data regression with the fixed effect model (FEM) approach as an approach in the analysis technique. According to Bell et al., (2019), FEM has various advantages—this analysis technique is able to control for unobserved constant effects between entities or, in this case, between countries, thereby reducing the potential for variable bias that is not listed in the model and providing more accurate estimates. FEM is also considered effective in overcoming emerging heterogeneities.

The fixed effect chosen is certainly not only based on the consideration of the model's advantages but also investigated through various tests. This study will use the Chow test, Hausman test, and Lagrange multiplier, which will support the researcher to choose the fixed effect as the method that best suits the research objectives. In addition, in support of the robustness of the model, this study will add a model stability test using a stationary, cointegration test, and all classical assumption tests, namely normality, heteroscedasticity, multicollinearity, and autocorrelation.

Results and Discussion

Development of Banking Stability

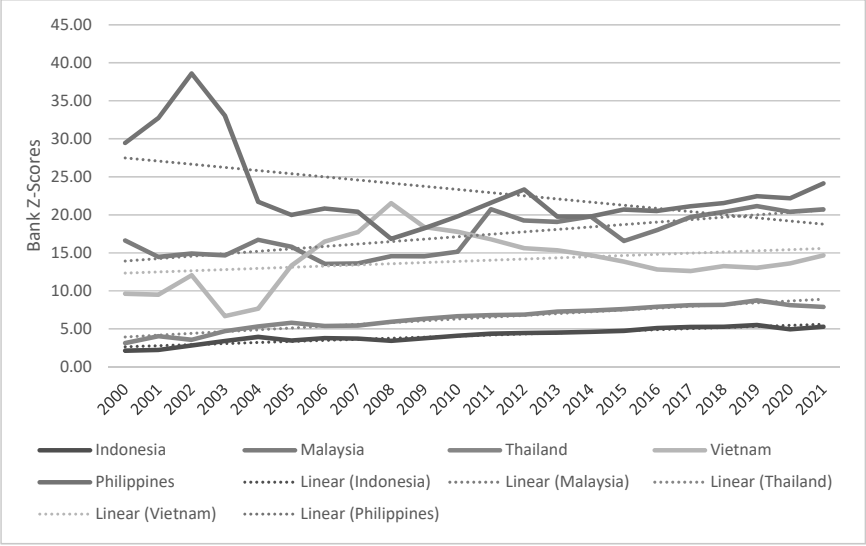
Banking stability shows an increasing trend in Vietnam, Malaysia, Thailand, and Indonesia. On the other hand, although the Philippines has the highest level of banking stability, it has declined over the past two decades (Figure 2). The Philippines has undergone significant banking reforms since the 1990s, after a period of very strict regulation. These

reforms include changes in capital regulations and increased bank capital restrictions, as reported by a World Bank survey (Manlagnit, 2015)this paper has examined the impact of Basel II on the cost efficiency of Philippine commercial banks from 2001 to 2011. The overall mean cost efficiency estimate is 0.75, indicating substantial inefficiencies in the banks averaging to 25% of total costs. Findings show that higher capital requirement tends to improve the cost efficiency but more powerful supervisors can adversely affect the efficiency of the banks. The other potential correlates that may help explain the efficiency of the banks are risk and asset quality and bank-specific variables. From a policy perspective, this study is informative to policymakers on the general direction in which to proceed with reforms (i.e., maintain higher capital requirements, curtail powerful supervisors, and enhance private monitoring. Although aimed at improving efficiency and reducing risk, rapid and frequent regulatory changes create uncertainty in the banking industry, resulting in high adjustment costs and operational strain. Increased capital restrictions can reduce banks' flexibility in managing portfolios, affecting profitability and long-term stability. In addition, external factors such as global economic fluctuations, political uncertainty, and financial market volatility also contribute to this downward trend in stability.

Malaysia showed the highest increase in banking stability. Malaysia is one of the most advanced Islamic banking centers in the world, with a government that actively supports and encourages the Islamic banking system (Lassoued, 2018). Although the debate over credit risk between Islamic and conventional banks is still ongoing, Malaysia has managed to create a relatively stable banking environment through effective supervision and comprehensive risk management policies.

Based on Figure 2, Vietnam has the third highest banking stability in terms of banking stability. Significant credit growth and stable financial market dynamics in Vietnam are considered to be factors influencing the country's high banking stability. In 2007, Vietnam has also joined the World Trade Organization. By joining the organization, Vietnam is quite reliable in boosting its economic growth. In addition, in the research Le et al. (2019), Vietnamese banks achieved structural reforms and liberalization; in this case, bank restructuring and the improvement of private banks.

Indonesia and Thailand have low banking stability, but trends over the past 20 years have increased. Thailand is the lowest-ranked and most financially unstable country, according to research Noman et al. (2018). International Monetary Fund - Monetary and Capital Markets Department (2019) also researched



Source: Data processed from World Bank, (2025b)

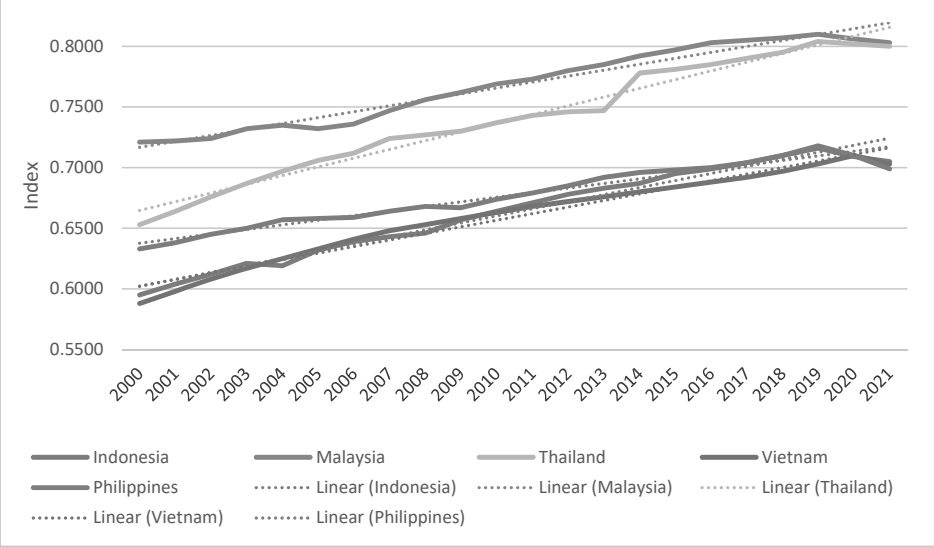
Figure 2. Development of Banking Stability in ASEAN

Thailand and found that the weakness of some companies and micro enterprises and the high household debt in Thailand also led to low banking stability in the country. Banking stability in Indonesia is relatively low compared to other ASEAN countries due to the banking sector consolidation process that began after the 1997 crisis and was officially launched through the Indonesian Banking Architecture (IBA) in 2004 (Mulyaningsih et al., 2016). Although consolidation aims to strengthen banks by increasing capital and managing risks, its impact on stability is not optimal. Consolidation can strengthen large banks but reduce competition, but reliance on this strategy without sweeping regulatory reforms hampers progress on stability.

Development of the Human Development Index

HDI showed a significant increase (Figure 3). In 2021, Malaysia, Thailand, Indonesia, and Vietnam were in the high HDI category, with scores between 0.700 and 0.799, whereas Vietnam was still in the middle category because it obtained a score of 0.6990. This increase reflects substantial progress in health, education, and living standards in these countries while signaling their success in addressing complex development challenges. This high HDI category reflects the ongoing efforts and effective policies implemented by the government to improve the quality of life and well-being of their population.

Malaysia and Thailand have the highest HDI in ASEAN due to their large investments in education and health. Malaysia focuses on strong basic education, whereas Thailand invests significantly in education and healthcare spending (Maneejuk & Yamaka, 2021) particularly higher education, on economic growth in the ASEAN-5 countries (i.e., Thailand, Indonesia, Malaysia, Singapore, and the Philippines. Malaysia's and Thailand's HDI scores are much higher than the average of countries in East Asia and the Pacific (0.749) as well as the global average (0.732). Malaysia has a high HDI due to consistent economic growth. Government policies that support human development also play an important role. However, HDI in ASEAN, including Malaysia, decreased slightly in 2020 due to the COVID-19 pandemic, which affected life expectancy and per capita income. During the economic crisis caused by the pandemic, banks faced challenges such as higher credit risk, declining lending, fluctuations in operating costs, inflationary impacts, and shifting consumer behavior (Hidayat et al., 2024). Thailand achieved an HDI score of 0.803 in 2022, showing progress from the previous year and ranking 66th globally. Women's HDI (0.807) is higher than men's (0.798), although income gaps and access to education remain (UNDP, 2024a). Although



Source: processed data from United Nations Development Programme, (2025)

Figure 3. Human Development Index in ASEAN

there has been significant progress, adjustments for carbon emissions are lowering HDI, and problems of social polarization and insecurity are hindering further progress (Chansarn, 2013).

Indonesia, Vietnam, and the Philippines show similar HDI trends. Indonesia has made progress in HDI, with life expectancy increasing to 71.7 years and the average expected school year to reach 13.6 years, comparable to the average in East Asia and the Pacific. The country's GDP per capita is USD 11,459. However, despite the increase in HDI, the planetary pressure-adjusted score (PHDI) dropped to 0.691, indicating a 3.8% decline from its initial score. This decline resulted in a downgrade in Indonesia's PHDI rating, which indicates a significant environmental impact (UNDP, 2020). Vietnam has shown considerable progress in HDI since 1990, with substantial improvements in education and life expectancy. Despite these advances, challenges such as gender inequality remain a challenge for all ASEAN countries. Access to education and labor force participation are increasing in Vietnam, but women's participation still faces gaps in employment opportunities and women's participation in leadership (UNDP, 2024b). The Philippines has made progress in the HDI from 0.598 in 1990 to 0.699 in 2021. The Philippines is currently ranked 116th in the world, 16th in Asia-Pacific, and 7th in ASEAN.

Descriptive Statistical Analysis

The results of descriptive statistics in this study are shown in Table 2. This table provides an understanding of the banking stability and HDI indicators in Malaysia, Indonesia, Vietnam, the Philippines, and Thailand. The number of observations in this study is 110 observations. The average banking stability proxied using the z-score of banks for the period 2000 to 2021 is 12.98. Meanwhile, the median value was slightly higher at 13.59. The range of BZS values varies widely, with a maximum of 38.58 and a minimum of 2.13. This shows a significant difference in the stability of the banking sector in the developing ASEAN region. A standard deviation of 7.70 indicates a relatively large variation in the data. A positive slope of 0.57 indicates a slightly skewed distribution towards a lower value. Kurtosis values close to 3 indicate a normal distribution.

Table 2

Descriptive Statistics

	BZS	HDI
Mean	12.98268	0.701627
Median	13.58834	0.697500
Maximum	38.57995	0.810000
Minimum	2.127169	0.588000
Std. Dev.	7.702451	0.057034
Curtosis	3.001905	2.293527
Jarque-Bera	5.899040	3.436139
Probability	0.052365	0.179412
Sum	1428.095	77.17900
Number of Sq. Dev.	6466.725	0.354560
Observation	110	110

Source: Author's calculation (2024)

The HDI showed an average of 0.7, indicating that almost all countries have a high category of HDI. Meanwhile, the average HDI score was slightly lower at 0.69. The HDI has a value range between 0.59 and 0.81. This shows the difference in the level of human development in ASEAN. A standard deviation of 0.057 indicates a relatively small variation in the HDI value. A positive slope of 0.25 indicates a slightly skewed distribution towards a higher value, whereas a kurtosis of 2.29 indicates a distribution that is close to the normal distribution. The Jarque-Bera test with a probability of 0.18 shows that the HDI distribution is close to the normal distribution.

Regression Estimation Results

Stationary testing is an important step in the analysis of time series data to ensure that the data used does not have trends or patterns that change over time so that the results of statistical analysis can be trusted. The stationarity test in Table 3 uses two methods—Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP)—to test the stationarity at the level and the first difference of the analyzed variables. BZS is not stationary at the level but becomes stationary after the first distinction is made, both by the ADF and PP tests. Meanwhile, the HDI variable has shown stationarity at the level based on the PP test but not

with the ADF. However, after the first difference, the HDI variable becomes stationary based on both tests. The stationary test shows the importance of making the first differentiation on non-stationary data to obtain valid analysis results.

Based on the cointegration of the test using Kao in Table 4, a probability value of 0.0013 or less than alpha 0.01, then H0 is rejected. Thus, the variables in the model have a long-term cointegration relationship.

In determining the best model, the selection of models through the Chow test and Hausman test shows that the fixed effect model is the most appropriate to use. The Chow test shows a probability value of 0.000, which means that the fixed effect model is better, whereas the Hausman test shows a probability value of 0.000, indicating that the fixed effect is better than the random effect. In conclusion, this study uses fixed effect as the best method.

HDI is positively and significantly correlated with influencing banking stability in ASEAN developing countries studied. An HDI coefficient of 26,750 indicates that an increase of one unit in HDI will lead to an increase in banking stability by 26,750 units, assuming the other variables are fixed or constant. A relatively small standard error of 1.319 compared to the coefficient suggests that this estimate is quite straightforward. This shows that developing countries in ASEAN with higher levels of human development tend to have more stable banking stability.

Based on Table 5, the results of the statistical test show that this panel data regression model is an excellent model for explaining the influence of HDI on banking stability in developing ASEAN. With an R-squared value of 0.949 and an adjusted R-squared value of 0.947, this model is able to explain about 94.7% of the variability of banking stability. The high R-squared in this result indicates that the independent variable (HDI) can explain most of the variation in the dependent variable (banking stability). This indicates that the relationship between HDI and banking stability is very strong, where increasing HDI, which includes aspects of education, health, and standard of living, has a significant impact on the quality and stability of the banking sector.

Table 3

Stationarity Test

Variable	Dickey Fuller Augmented		Phillips-Perron	
	level	1st Difference	level	1st Difference
BZS	14.1567	39.2059***	13.3486	66.4992***
HDI	15.4735	15.2510**	29.9038***	23.9299***

Source: Author's calculation (2024)

Table 4

Kao Residual Cointegration Test

	t-Statistic	Prob.
ADF	-3.022259	0.0013
Residual variance	4.142296	
HAC variance	3.664084	

Source: Author's calculation (2024)

Table 5

Estimated Results

Model Selection Test				
Chow Test				0.000
Hausman Test				0.000
Regression Results				
Variable	**Coefficient**	**STD error.**	**t-Statistics**	**Prob.**
C	-5.786385	0.926922	-6.242577	0.0000***
HDI	26.75077	1.319058	20.28021	0.0000***
Statistics				
R-squared	0.949442	Average dependent var		26.43325
R-squared adjusted	0.947011	S.D. depends on var		14.52048
F-stats	390.6097	Durbin-Watson Statistics		1.726546
Prob(F-stats)	0.000000			
Cross-sectional effects				
Indonesia_	-7.923009			
Malaysia_	2.755694			
Thailand_	-7.410711			
Vietnam_	1.936609			
Philippines_	10.64142			
Classic Assumption Test				
Normality Test			3.0358	0.2191
Autocorrelation Test				1.7265
Heteroscedasticity Test				0.0740
Multicollinearity Test				
	HDI		**BZS**	
HDI	1.0000		0.1081	
BZS	0.1081		1.0000	

Note: *, **, and *** indicate the level of significance at the 10%, 5% and 1% levels
Source: Author's calculation (2024)

The Durbin-Watson statistical value is 1.7265, meaning that there are no serious problems related to autocorrelation. These results confirm that HDI contributes significantly and positively to banking stability in the ASEAN region, with a very strong and reliable model that explains the relationship between independent and dependent variables. The heteroscedasticity result using Breusch-Pagan was 0.0740, meaning that there was no heteroscedasticity problem.

The results of the cross-section effect show that there is a variation in banking stability in ASEAN developing countries. Indonesia and Thailand have a negative and significant influence on banking stability, namely proxies using bank z-scores, indicating that conditions in both countries tend to weaken banking stability compared to other countries. In contrast, Malaysia and Vietnam showed positive influences, suggesting that factors in both countries favored better banking stability. Based on the cross-section effect, the Philippines shows the highest positive coefficient, which means that banking stability in the country is stronger compared to other ASEAN countries.

The Relationship Between Human Development Index Variables and Banking Stability

Although macroeconomic factors such as monetary policy, banking regulation, and global economic conditions have been widely discussed and considered adequate in explaining banking stability and resilience, the study also highlights the importance of HDI as an additional factor that has not been fully taken into account in previous studies. This study shows that HDI is positively and significantly correlated with influencing banking stability in ASEAN. The three main dimensions that make up the HDI value, such as the quality of education, health, and a decent standard of living, are statistically significant in strengthening the stability of the banking sector. If the country has a high HDI category, people tend to have achieved higher levels of education and income. This will increase public access to financial services, of course, with various government policies that emphasize financial literacy in the community. Not only that, a smarter society will be able to educate the people around them to start saving and using credit more wisely for productive activities. In such an effort, it will reduce non-performing loans measured in NPLs. This environmental and efficient banking condition will support increased banking stability. Thus, investment in human development is important for every country, not only for economic growth but also in an effort to strengthen the stability of the banking sector, which is a key pillar in maintaining overall economic stability, especially for emerging ASEAN.

Many developing countries experience significant economic inequality, characterized by substantial disparities between the rich and the poor (Nurhaliza et al., 2024). High banking stability plays an important role in achieving sustainable development. A sophisticated and stable financial system is an important foundation in supporting development financing and realizing the Sustainable Development Goals (SDGs) without poverty, healthy living, and quality education. Increasing HDI in ASEAN developing countries creates a more financially stable environment, which in turn facilitates financial institutions in supporting development projects aligned with the SDGs. Financial institutions operating in a stable financial system are more likely to invest in initiatives that support the SDGs goals. Financial stability, reflected in the increase in z-score banks, is critical to achieving the SDGs, which is in line with the findings of (Ozili & Iorember, 2023). This result confirms that investment in efforts to increase HDI not only strengthens the banking sector but also accelerates the achievement of the SDGs in the ASEAN region.

ASEAN countries showed HDI in the high category for Malaysia, Thailand, Indonesia, and the Philippines, indicating that their citizens have better access to financial services, better financial management, and more stable incomes, all of which contribute to reduced credit risk and improved banking portfolio quality. However, although HDI in ASEAN countries is relatively high, banking stability is still affected by various other factors such as risk management, banking regulation, and resilience to global economic fluctuations. In resource-rich countries, revenues from natural resources can be invested in sectors that support financial stability, such as renewable energy initiatives and education, which also contribute to the achievement of the SDGs (Luo et al., 2024).

The low banking stability in Indonesia and Thailand, despite the relatively high HDI of both countries, reflects economic complexity. Although high HDI indicates progress in the quality of education, health, and living standards, which should support banking stability, a number of structural and external

factors have weakened the banks' z-scores in both countries. Despite the increase in social aspects as measured by HDI, Indonesia is still heavily dependent on sectors that are vulnerable to global volatility, such as commodities. Indonesia is a country that relies heavily on the export of commodities such as crude oil, natural gas, and coal (Hidayat et al., 2023). Indonesia experienced significant net capital flows due to high banking liquidity excesses exacerbated by a decline in commodity prices in 2013 (Hudaya & Firmansyah, 2023). The high dependence on foreign financing also increases vulnerability to fluctuations in the rupiah exchange rate against the dollar until 2024, especially when global financial markets are still uncertain, such as during a period of uncertainty about the reduction of fiscal stimulus by the Federal Reserve. Thailand is also facing similar challenges. Despite Thailand's high HDI, its main economic sectors, including the tourism and export sectors, are particularly vulnerable to external shocks. Dependence on global demand and external conditions makes banking stability vulnerable to global economic fluctuations (Taskinsoy, 2020b).

Financial inclusion efforts in Indonesia, especially through digital transformation and various government programs, have played an important role in increasing HDI, which in turn can strengthen banking stability. Initiatives such as the establishment of the Regional Financial Access Acceleration Team (TPAKD) and the One Student One Account (OSOA) program aim to expand financial access among the community, including in rural areas and among women who are often marginalized (Setiawan et al., 2024)this study aims to investigate the factors influencing the behavioral intention to adopt Fintech from the perspective of Indonesian women. The research data were collected from 409 Indonesian female respondents and analyzed using the SEMinR statistical data analysis tool. Structural equation modeling (SEM. Thailand's efforts to increase financial inclusion focus on subnational development and strengthening the financial sector. The Asian Development Bank (ADB) plays an important role by supporting the Thai government in several aspects. ADB helps governments and the private sector to improve the competitiveness of micro, small, and medium enterprises (MSMEs) through better trade, cross-border investment, new technologies, and innovation (Asian Development Bank, 2021). In addition, ADB focuses on strengthening financial inclusion through microfinance development and special support for vulnerable groups such as women and disadvantaged communities, especially in poor provinces. These programs aim to improve financial access and financial management in areas with slow growth, including increased competence in the digital, agriculture, biotechnology, and automation sectors. These efforts support increased HDI by increasing access to education, health, and income, ultimately contributing to financial stability by creating a more inclusive and resilient economy.

Financial literacy in Malaysia has become the government's main focus to support SMEs. Through the SME Master Plan 2012-2020, the Malaysian government targets to increase the contribution of SMEs to the economy, but its performance is still below the ASEAN average (Whah & Lim, 2018)to assess policies and initiatives implemented for the development of Malaysian SMEs, from the Eighth Malaysia Plan (8MP).

In Vietnam, financial literacy is still low compared to other developing countries, so the use of official financial instruments is minimal, and illegal credit is still rampant. The government seeks to improve this through a comprehensive financial strategy and education reform by incorporating financial training into the curriculum at all levels of education (Nguyen & Doan, 2020).

In the Philippines, financial literacy rates are very low, placing them at the bottom of the rankings. Based on a 2021 survey from the Bangko Sentral ng Pilipinas (BSP), only 20% of Filipinos fully understand basic financial concepts. To address this problem, the Philippine government, through the BSP, seeks to improve financial education broadly to protect the public from financial risks such as predatory and high-interest loans (Bancoro, 2023).

In Indonesia, financial literacy and inclusion policies follow Indonesia's National Strategic Framework for Financial Literacy to improve public understanding and access to financial products (Christiani & Kastowo, 2023). This strategy includes education, increasing economic competence, and increasing access to finance. Although the financial literacy index has reached a fairly high level, there are still challenges, including the number of unlicensed financial institutions that are still used by the public.

In Thailand, financial literacy is still in the development stage, although many households have

internet access through smartphones and computers. The Thai government's efforts include financial education programs that aim to increase public knowledge about financial products and services. One of the key initiatives is the financial literacy program launched by the Bank of Thailand, which focuses on improving understanding of money management and financial planning (Phan et al., 2024). Constraints in Thailand, similar to Vietnam, include the digital divide and financial literacy that varies between urban and rural populations.

The Philippine banking system shows strong stability despite facing global challenges. Until the end of 2021, the banking sector showed positive growth, with an increase in assets driven by an increase in deposits. The bank's net profit increased significantly, with asset and equity returns remaining stable and showing good performance. Credit activity showed consistent improvement, with an increase in credit channeled to important sectors such as MSMEs. Asset quality was well maintained, as evidenced by the decline in the non-performing loan ratio and the improvement in the capital adequacy ratio. The bank's liquidity is also excellent, with the liquidity coverage ratio well above the minimum threshold. The Philippines is taking advantage of the pandemic to accelerate financial inclusion through digital transformation, with the target of increasing digital transactions and expanding financial access for more adults (Diokno, 2022). In addition, the Philippine government is encouraging sustainability by introducing regulations that mandate the application of sustainability principles in banking operations, including funding for green projects. These measures aim to strengthen the financial system and support inclusive and sustainable long-term economic growth.

The development of a dual banking system that includes Islamic and conventional banking has also encouraged increased banking stability in Malaysia. Malaysia is an international Islamic financial center that strengthened the banking sector after the 1998 Asian financial crisis (Ibrahim et al., 2019)

Malaysia also consistently ranks at the top of the list of credit facilities according to the World Bank's Doing Business report. Initiatives like this have the opportunity to increase financial access for the community, improve living standards, and improve financial stability. Meanwhile, Vietnam has improved banking stability as a result of structural reforms and liberalization. However, despite Vietnam's improving banking stability, there are challenges to low financial inclusion compared to other Asian countries. Efforts to expand access to banking services to MSMEs and communities in remote areas are expected to be the main driver of economic growth in improving human development (Hidayat et al., 2022).

Conclusion

The results of this study conclude that HDI has a positive influence on banking stability in Indonesia, Malaysia, the Philippines, Thailand, and Vietnam. Increased HDI, especially for countries with high HDI scores, is often associated with high levels of education, complete access to healthcare, and high living standards. This study covered developing countries in ASEAN because it has not been studied in depth. Four countries in ASEAN show a high HDI category, except for Vietnam. In addition to the dimensions of education, health, and decent living standards, high HDI also shows the potential of people with a high level of financial literacy, one of which is access to funding such as bank loans. With people who have high financial literacy, there is less possibility of bad loans and other banking problems. Banks can focus more on risk management and more innovative and inclusive financial development.

The highest HDI is in Malaysia, which is driven by the quality of life and adequate infrastructure, which contribute to a stable financial environment. On the other hand, Indonesia and Thailand have the lowest banking stability in ASEAN studied, suggesting that there are challenges to achieving banking stability. Based on these findings, there is a need for an approach to increase multidimensional HDI that will strengthen the financial sector, especially in Indonesia and Thailand. There is a need for financial institution policies like those carried out by central banks in each country, such as increasing financial literacy for students.

These findings show that in some ASEAN countries, an increase in HDI has the potential to support banking stability, but this is also influenced by other factors such as fiscal policy and banking sector management. Efforts to improve the skills of uneducated and educated workers will strengthen the banking sector by reducing the risk of bad loans

and improving asset quality. In addition, regional integration and ASEAN collaboration in terms of financial regulation and monetary policy formation can create a more coordinated and stable financial market.

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The Asia-Pacific Social Science Review (APSSR) is an internationally refereed journal published four times in a year—March (online edition), June (online and print editions), September (online), and December (online and print) by De La Salle University in Manila, Philippines. It aims to be a leading venue for authors to share their work on compelling and emerging topics in the social sciences and related disciplines with the global community of academics, researchers, students, civil society, policymakers, and development specialists.

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ACTION	STATUS	ID	TITLE	SUBMITTED
Copyright Completion submitted (19-Dec-2024) - view	Contact Journal ADM: Velasco, Joseph • Accept (19-Dec-2024) view decision letter	APSSR-2024-0196.R1	The Effect of the Human Development Index on Banking Stability in ASEAN View Submission	18-Nov-2024
a revision has been submitted (APSSR-2024-0196.R1)	Contact Journal ADM: Velasco, Joseph • Major Revision (14-Nov-2024) • a revision has been submitted view decision letter	APSSR-2024-0196	The Effect of the Human Development Index on Banking Stability in ASEAN View Submission	13-Aug-2024
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Decision Letter (APSSR-2024-0196)

From: joseph.velasco@dlsu.edu.ph

To: ariodillahhidayat@fe.unsri.ac.id

CC:

Subject: Asia-Pacific Social Science Review - Decision on Manuscript ID APSSR-2024-0196

Body: 14-Nov-2024

Dear Dr. Hidayat:

Manuscript ID APSSR-2024-0196 entitled "The Effect of the Human Development Index on Banking Stability in ASEAN" which you submitted to the Asia-Pacific Social Science Review, has been reviewed. The comments of the reviewer(s) are included at the bottom of this letter.

The reviewer(s) have provided their comments and recommended major revisions to your manuscript. Therefore, I invite you to respond to the reviewer(s)' comments and revise your manuscript.

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Because we are trying to facilitate timely publication of manuscripts submitted to the Asia-Pacific Social Science Review, your revised manuscript should be submitted by 13-Jan-2025. If it is not possible for you to submit your revision by this date, we may have to consider your paper as a new submission.

Once again, thank you for submitting your manuscript to the Asia-Pacific Social Science Review and I look forward to receiving your revision.

Sincerely,

Maria Caridad Tarroja, Ph.D.
Editor-in-Chief
Asia-Pacific Social Science Review
De La Salle University

Reviewer(s)' Comments to Author:

Reviewer: 1

Comments to the Author
Recommendations for Manuscript ID APSSR-2024-0196, Title „ The Effect of the Human Development Index on Banking Stability in ASEAN” for Asia-Pacific Social Science Review.
General Comments
From my point of view, it is a very interesting topic and simultaneously it seems that to the best of my knowledge is an empirical research aims to investigate the relationship between the Human Development Index (HDI) and banking

stability in these countries, given that changes in HDI can have a significant impact on the emerging banking sector. This study uses quantitative data for the annual period from 2000 to 2021. Secondary data was obtained from Our World in Data and the International Monetary Fund. The analysis technique in this study uses the regression of panel data of the Fixed Effect Model type. The results of the study show that the increase in HDI has an impact on increasing banking stability in ASEAN studied. This study highlights that Indonesia and Thailand have the lowest banking stability; this is in line with the results of the cross section effect. Improving the quality of life and investing in education and health should be a priority, given its immediate impact on the resilience of the banking system.
The paper contains the following sections: Introduction, Literature Review, Data and Methods, Results and Discussion, Discussion, Conclusion.
However, I find some recommendations:
1. The Manuscript needs careful English proofreading because there are some shortcomings. For instance, the article "the" is sometimes missing in front of nouns, the message in some paragraphs is not clear enough. It looks like the first part was written by one author with a greater command of the English language, and the rest of the paper was written by someone else. The numerous grammar errors made this a difficult paper to read. It was strange to see the authors refer to tables that were not submitted. I was unable to find any supplementary material to the submission, so I think this was truly omitted by the authors. Please read the manuscript carefully.
2. The abstract must contain the main purpose of the paper, the research method used in the research and the main contributions.
3. It would be very useful to add in the "Introduction" section the purpose, objectives and hypothesis of the research. I consider that a weak point of the paper is that the authors did not show the novelty of the paper compared to other works. That is why, I consider that the introduction should specify the novelty of the paper compared to other papers published in this area.
4. There are some errors regarding some tests: Curtosis instead of Kurtosis, Jark-Bera instead of Jarque-Bera.
5. The Results and Discussion section and the Discussion section must be renamed because the word Discussion appears twice.
6. The research is well based on science and the results are in agreement with the theoretical part. The regression model applied to the analyzed data is correctly used in the analysis undertaken, it is a strength point of this paper.
7. At the same time, the authors are required to present Descriptive Statistics, Correlation matrix with all tests and indicators: Standard deviation, Jarqe-Bera, Skewness and Kurtosis interpretation, Jarqe-Berra with probabilities analysis, etc.
8. It is important to present the VIF test on multicollinearity between independent variables. Heteroskedasticity and endogeneity tests are also important in this study. All these aspects that are not found in the paper represent weaknesses of the research.
9. The authors applyed the structural equation method, then they must apply the following tests: the authors must to apply an econometric method like regression or panel with fixed effect estimation or the random effect estimation (see for instance, Baltagi (2008), Hsiao (2014) and Andre B et al. (2015)). Besides, the corresponding tests to determine which is the best method of estimation is needed (see the Hausman test, the Breusch and Pagan (1980)´s Lagrange multiplier, the F test for fixed effects to test whether all unobservable individual effects are zero); The authors talk about the relationship between these variables, however they do ot support the empirical evidence providing panel cointegration tests that are crucial (see for instance Kao (1999) panel data cointegration test, the Pedroni (1999, 2004) panel data cointegration test or the Westerlund (2005) panel data cointegration test, among others).
I think that the literature needs to be improved with other recent works, refers to the companies listed on the economic growth. That is why I recommend the authors to refer to other recent works indexed in Web of Science, Scopus, Emerald and Cambrige Journals. We suggest that the authors cite papers published in Web of Science Journals, such as:
1. https://doi.org/10.3390/math11061528.
2. https://doi.org/10.3390/math10122118.
3. https://doi.org/10.3390/math9243178.
4. https://doi.org/10.3390/math10213964
5. https://doi.org/10.3390/jrfm14060260
6. https://doi.org/10.3390/math10142503
7. https://doi.org/10.3390/math10193660
8. Batrancea, I., and L. M. Batrancea. "The World Financial Crisis–Roots, Evolution &Consequences." The Financial and Economic Crisis, Causes, Effects and Solutions, Alma Mater Publishing, Cluj-Napoca (2009): 143-155.
9. Batrancea L., Batrancea I., Moscviciov A. (2009), The Roots of the World Financial Crisis, Annals of Faculty of Economics, 3(1):57-62.
10. Bătrâncea, I., Moscviciov, A., Sabău, C., Bătrâncea, L.M. (2013) "Banking Crisis: Causes, Characteristic and Solutions", Proceedings of the DIEM 2013, pp.16-29.
11. Batrancea, L.M., de Jesús Bello Gómez, F., Nichita, A., Dragolea, LL. (2023). Crunching Numbers in the Quest for Spotting Bribery Acts: A Cross-Cultural Rundown. In: McGee, R.W., Benk, S. (eds) The Ethics of Bribery. Springer, Cham. https://doi.org/10.1007/978-3-031-17707-1_19, pp:329–343.

In conclusion, the article should be improve. It should also be enhanced with a review of the literature adequate to the subject and a broader interpretation and commentary of the research results.

Reviewer: 2

Comments to the Author
1. Brief description of the state of the banking industry in ASEAN was adequate.
2. There are several claims made in the article that do not have substantiated evidence. For example, on pages 6 and 7, the author(s) said that: "The influence of HDI on banking stability is intertwined through several mutually supportive mechanisms. The increase in the length of time a person spends in school, as one of the components that form the HDI value, reflects a person's smarter choice of investment, financial products, and avoiding credit risk in a country. Residents with a higher level of education are considered to be able to manage their personal finances more intelligently and choose banking products that are more effective in supporting productivity. Various studies also mention that high education in a person makes his life more feasible with a high increase. People will tend to save, banking liquidity will be maintained, and banks will be more resilient in handling economic shocks and maintaining their operational efficiency, which is often reflected in operational costs." Where is the citation of these 'various studies'? Also, there studies that belie the claim that higher educational attainment necessarily result in better financial decision making. Should these studies not also be cited to provide a more holistic picture of the situation?

3. Several factors affecting banking stability have already been identified in previous studies. Is there reason to believe that these previous models are inadequate, and therefore necessitate the need to identify additional variables? Haven't these previous models served the purpose of ensuring the stability and resilience of banks?
4. The study of Al-Shimari et al (2021) talks about the reciprocal relationship between financial systems stability and HDI. But the authors of the authors of the manuscript being reviewed make it appear that the cause-and-effect is one way. Also, the study of Banerjee (2020) shows that financial inclusion has an effect on human development. But the authors of the manuscript being reviewed seem to imply that the relationship of the variables is the other way around. These portions of the paper indicate that the authors either misread the articles they cited or are citing the articles out of their proper context, as they seem to have done in the case of the article of Jima and Makoni (2023).
5. Overall, the rationale for the proposed study was not adequately discussed, bringing to question the value of the article itself.
6. It is interesting that in pages 10 to 12, the author made references to factors that explain the state of banking stability of the selected ASEAN countries. It seems that macroeconomic and regulatory factors, as mentioned in previous literature, are the critical factors that influenced banking stability in these countries. The statements were expressed in conclusive terms, which means that the authors seem to accept these as the main explanation for the conditions in each country.
7. Can the authors explain the very high R-squared of 0.949? Is this not something that requires closer examination?
8. I see that the authors included in their discussion that there are other factors that come into play, which could partly explain their statistical results. But these explanations actually only highlight that previous variables associated with banking stability and resilience are adequate in explaining the phenomenon of interest.
9. Some of the conclusions are overreaching, way beyond what the statistical results suggest. The authors must be careful about making such conclusions.

Date Sent: 14-Nov-2024

Decision Letter (APSSR-2024-0196.R1)

From: maria.caridad.tarroja@dlsu.edu.ph

To: ariodillahhidayat@fe.unsri.ac.id

CC:

Subject: Asia-Pacific Social Science Review - Decision on Manuscript ID APSSR-2024-0196.R1

Body: 19-Dec-2024

Dear Dr. Hidayat:

It is a pleasure to accept your manuscript entitled "The Effect of the Human Development Index on Banking Stability in ASEAN" in its current form for publication in the Asia-Pacific Social Science Review. The reviewers found your revision satisfactory. Your paper will be included int Volume 25, Issue 1 of APSSR which may tentatively come out in March 2025.

Thank you for your fine contribution. On behalf of the Editors of the Asia-Pacific Social Science Review, we look forward to your continued contributions to the Journal.

Sincerely,
Dr. Maria Caridad Tarroja
Editor-in-Chief, Asia-Pacific Social Science Review
maria.caridad.tarroja@dlsu.edu.ph

Date Sent: 19-Dec-2024

The Effect of the Human Development Index on Banking Stability in ASEAN

by Ariodillah Hidayat

Submission date: 27-Mar-2025 09:14AM (UTC+0700)
Submission ID: 2599075390
File name: ffect_of_the_Human_Development_Index_on_Banking_Stability_in.pdf (809.64K)
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Character count: 54082

The Effect of the Human Development Index on Banking Stability in ASEAN

Ariodillah Hidayat

Xenaneira Shodrokova

RESEARCH ARTICLE

The Effect of the Human Development Index on Banking Stability in ASEAN

Ariodillah Hidayat* and Xenaneira Shodrokova
Sriwijaya University, South Sumatra, Indonesia
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Abstract: Global phenomena show that the quality of human development plays an important role in various aspects of the economy, including the stability of the banking sector. In the ASEAN region, developing countries such as Indonesia, Malaysia, Vietnam, the Philippines, and Thailand are undergoing rapid economic transformation, which can affect the dynamics of banking stability. The study aims to analyze the relationship between the Human Development Index (HDI) and banking stability in these countries, assuming that improving the quality of human development can strengthen the stability of the emerging banking sector. The study used panel data from 2000 to 2021 obtained from Our World in Data and the International Monetary Fund. The analysis technique in this study uses panel data regression, namely the fixed effect model, to capture the specific influence of HDI on banking stability in each country. The results show that the increase in HDI contributes positively to banking stability in ASEAN, which shows the importance of improving the quality of life that supports economic stability. The main contribution of this research is to provide empirical evidence on the role of HDI as an important factor in strengthening the stability of the banking sector, as well as to enrich the literature on the relationship between human development and financial stability in developing countries.

Keywords: Human Development Index, Banking Stability, ASEAN

Banking stability is an important foundation for the sustainability and health of a country's financial system. Banking stability does not have a generally agreed definition. Policymakers usually consider it to be a condition in which there is no banking crisis (Ozili, 2018). According to some sources, banking stability refers to the conditions under which banks can operate effectively and efficiently without facing systemic risks that could threaten their operations (Ellis et al., 2022). This includes the bank's ability to manage and withstand economic and financial shocks, maintain adequate liquidity, and maintain customer and investor confidence. The main indicators used to assess banking stability include capital adequacy ratio, liquidity, asset quality, profitability, and risk management effectiveness. A stable banking system is not only able to survive the financial crisis but also plays an important role in boosting economic growth (Alqahtani & Mayes, 2018). Stable banks provide funds for productive investments, support financial transaction activities, and facilitate the smooth flow of credit to various economic sectors in need.

ASEAN consists of 10 countries with different levels of economic development ("The Association of Southeast Asian Nations," 2024). ASEAN has become one of the fastest-growing regions in the world, contributing significantly to the global economy (Nguyen & Nguyen, 2018). ASEAN has managed to attract high foreign investment, increase international trade, and implement various structural reforms in an effort to strengthen its economic competitiveness. In 2022, ASEAN economies reached a nominal GDP of USD 3.6 trillion, making it the largest in Asia. ASEAN's nominal GDP per capita was recorded at USD 3.3, showing a significant increase in 2021 (ASEAN Secretariat, 2023). Economic integration initiatives through the ASEAN Economic Community (AEC) have successfully promoted policy harmonization, increased labor mobility, and strengthened intra-regional trade relations. ASEAN is dominated by countries in the developing category. In the end, developing countries recorded higher per capita incomes, more job opportunities due to increased competition among economic actors, high levels of foreign investment, and higher living standards (Batrancea et al., 2021).

ASEAN has a high banking stability health, with a bank z-score of 5.27. This is reflected in Figure 1. This high level of stability shows that banking conditions are stable and strong, and they are able to avoid potential financial crises, such as those that occurred in 2008 and the crisis caused by COVID-19. This condition reflects effective and efficient capital, liquidity, and risk management (Budnik & Bochmann, 2018). Prudent monetary and regulatory support and banking sector reforms can make banking stability work. The diversity of different economic and market structures in ASEAN makes it important to study banking stability. Developing countries in ASEAN will be able to provide efficient credit facilities, support the private sector and third parties in productive investment, and strengthen their economies in the face of national and global crises if banking stability is maintained in a healthy manner (Bhegawati & Utama, 2020).

Various studies by researchers have previously stated that many causal factors are able to affect banking stability. However, what attracts the most attention is how the level of human development reflected in HDI, measured through three dimensions, is able to affect the stability of the banking system

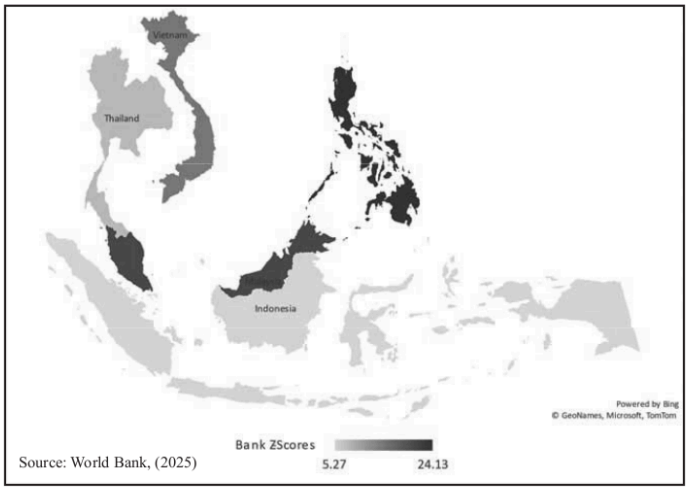


Figure 1. Banking Stability in ASEAN in 2021

in developing countries. These three dimensions are health, education, and a decent standard of living (Liu et al., 2023). The increase in HDI is related to the high quality of life of the community—the condition of human resources that are able to save, invest, understand financial products, and manage their funding for productive activities. Ngouhouo and Nchofoung, (2022) said that the country, which generally has a high HDI, has a banking system that is resistant to crisis conditions and its people tend to be investment literate. In addition to the influence of HDI, various studies also analyze how the structure of financial markets, regulations such as monetary policy arrangements by central banks, and macroeconomic conditions in the region have the potential to affect banking stability. However, research on the impact of HDI on z-score banks is still not widely investigated. Various studies also mention that increasing HDI is important in supporting the SDGs, which emphasize poverty reduction and improving the quality of life as key pillars to achieve sustainable and inclusive economic growth (Halisçelik & Soytas, 2019).

Scandinavian countries tend to have high HDI, based on data that also shows high banking stability. These countries not only rank high in life satisfaction but also in social support, freedom to make life choices, and low levels of corruption (Martel et al., 2020). This contributes to better financial literacy and more efficient risk management. Research by Raza et al. (2019) supported that countries with higher HDI tend to have higher levels of financial inclusion and more stable banking systems, as more educated and healthy people are better able to manage their finances and understand the products that banks offer in supporting a decent life. However, is this relationship the same in developing countries in ASEAN, such as Indonesia, Malaysia, Vietnam, the Philippines, and Thailand? This, of course, still needs further research.

The rapid transformation in the ASEAN region has brought opportunities as well as challenges for the banking sector. In the face of global economic dynamics, banking stability is an important foundation in maintaining sustainable economic growth in developing countries such as ASEAN. One of the factors that is rarely studied but has a potential role is the quality of human development. In ASEAN, where human development disparities are still a major issue, it is important to understand how increasing HDI can have an effect on strengthening the stability of the financial system.

This study is particularly relevant because the relationship between HDI and banking stability in ASEAN developing countries has not been studied in depth. Although HDI is recognized as an important indicator in assessing human progress and quality of life, specific research exploring the impact of HDI on banking system stability in ASEAN countries is still very limited. Previous research has only focused on macroeconomic factors such as inflation, interest rates, or monetary policy in analyzing banking stability, such as in Ehigiamusoe and Samsurijan (2021), Viphindrartin et al. (2021), and Ehigiamusoe et al. (2020). In addition, previous research tends to examine global coverage or is limited to developed countries (Ullah et al., 2024; Winkler & Beck, 2021). Based on the previous literature and theory, the hypothesis of this study states that the increase in HDI will have a positive and significant effect on banking.

Using a fixed-effects model of panel data regression, the study offers a comprehensive analysis of how HDI variations affect banking stability in the ASEAN region, as well as addressing differences between countries in the region. This approach not only allows for a sharper understanding of the role of HDI in terms of financial stability but also makes a significant contribution to the literature by providing new perspectives that are important for the development of banking policy and the national economy. By presenting a more detailed and contextual analysis, this study enriches the academic literature and provides a solid basis for policymakers to formulate more effective strategies to improve the resilience of the banking system in ASEAN. In addition, this research provides a new perspective on policy development that integrates human development as a key element in strengthening the banking sector.

The rest of this study is explained as follows. In the second part, previous theories and research are discussed. The third part discusses the data and research methods. The fourth part discusses the results and discussions. The fifth section discusses conclusions.

Literature Review

Banking stability calculates the ability of the banking system to carry out its functions effectively and efficiently without significant disruption, even in volatile economic conditions and when experiencing crises

(Taskinsoy, 2020a). Banking stability is considered important because banks play a central role in the economy by carrying out intermediary functions such as distributing credit, providing liquidity, and facilitating payments or as an intermediary institution between people with excess and shortage of funds (Aramonte et al., 2021). Some studies have found that factors that can affect banking stability are bank financial health, macroeconomic environment, regulation and supervision, and public trust. A bank's financial health is measured by a variety of indicators, including capital adequacy ratio, asset quality, profitability, and liquidity. Several studies also mention that economic stability, inflation, and overall economic growth can also affect banking stability. Effective regulatory policies and supervisory functions by each country's financial authorities can also improve banking stability and public confidence in the banking system.

HDI is an indicator used to calculate or compare the level of human development. HDI was introduced by the United Nations Development Programme (UNDP, 1990) as a broader measure of human welfare compared to only using a measure of the level of welfare, namely GDP. HDI includes three dimensions of human development, namely, life expectancy at birth, education level, and standard of living (Jalil & Kamaruddin, 2018). The health dimension is measured through human life expectancy, measuring the level of health quality and health conditions. The education dimension is measured using the level of education achieved by the adult population as well as the rate at which school participation lasts, reflecting the access and quality of education available in the country. The concept of HDI emphasizes that economic development is not only about economic growth but also about comprehensively improving the quality of human life (Rahman et al., 2020).

The influence of HDI on banking stability is intertwined through several mutually supportive mechanisms. The increase in the length of time a person spends in school, as one of the components that make up the HDI value, reflects a person's investment choices, financial products, and smarter credit risk avoidance in a country. Residents with higher levels of education are considered to be able to manage their personal finances more intelligently and choose banking products that are more effective in supporting productivity, as in the study by Johan et al. (2021). Zhou et al. (2023) conducted a survey of the ranks in China and found a strong positive correlation between education and financial literacy. Various studies also mention that a person's higher education makes their life more feasible (Nixon, 2020; Gutmann, 2015). The relationship between education and wealth is also strong. A higher income makes saving easier, and saving is necessary to build wealth (Wolla & Sullivan, 2017). People will tend to save, banking liquidity will be maintained, and banks will be more resilient in dealing with economic shocks and maintaining their operational efficiency, which is often reflected in operational costs.

The HDI factor on banking stability is still minimally studied, especially in developing countries. Research by Al-Shimari et al. (2021) showed the existence of a reciprocal relationship between HDI and financial system stability. The study examined the country of Saudi Arabia and concluded that an increase in HDI tends to improve banking stability. This happens because healthier and more educated people tend to be more financially stable and avoid the risk of bad credit. Research by Banerjee (2020) examined the relationship between financial inclusion, financial stability, and human development using the populations of South Asian countries. The results of the study highlighted that financial inclusion can increase HDI. Research by Jima and Makoni (2023) using Granger's causality test revealed the existence of separate bidirectional causality and combined unidirectional causality, which showed the complementarity between the variables of financial inclusion, financial stability, and economic growth. In addition, with sufficient capital reflected in the value of the capital adequacy ratio, banks are better able to maintain operational activities without worrying about facing a crisis (Markman & Venzin, 2014).

Data and Methods

This study will examine the relationship between HDI and banking stability in the ASEAN region, namely Indonesia, Malaysia, Thailand, the Philippines, and Vietnam. These five countries were chosen because they represent countries with different stages of economic development in the ASEAN region, have dynamic market characteristics, and are included in developing countries with rapid growth. This study utilizes annual data from 2000 to 2021 obtained from Our World in Data and the IMF. The operational details of the variables used are described in Table 1.

Table 1

Variable Operations

Variable	Definition	Formula
Banking Stability (BZS)	A bank's z-score captures the likelihood of a country's commercial banking system defaulting. The Z-score compares a country's commercial banking system buffers (capitalization and yields) to the volatility of those yields.	$Z - scores = \frac{ROA + CAR}{\sigma ROA}$ ROA indicates the rate of return on assets, CAR represents the capital adequacy ratio, and σROA is the standard deviation of the total return on assets.
Human Development Index (HDI)	A summary of the average achievement measures on the main dimensions of human development, namely longevity and health, knowledge, and a decent standard of living.	First, each indicator is normalized to a scale of 0 to 1 by setting minimum and maximum values. Countries with indicator values above or below a minimum score of 0, while countries above or above a maximum score of 1. The normalization formula used is: $HDI(i) = \frac{(Actual\ x_i value - minimum\ x_i value)}{(Maximum\ x_i value - minimum\ x_i\ value)}$ Second, the indicator is combined by calculating the arithmetic mean for the educational indicator and then calculating the geometric average of the three dimensions.

Source: World Bank, (2025b); United Nations Development Programme, (2025)

This study applies panel data regression analysis to test the influence between the variables studied. The regression equation model used in this study is formulated mathematically in Equation (1), which explains the functional relationship between independent variables and dependent variables.

$$BZS_{it} = \beta_0 + \beta_1 HDI_{it} + e_{it} \quad (1)$$

where β is a constant; BZS is banking stability, which is a proxy using the bank's z-score; HDI is the human development index; i is the cross-section; t is the time series; and e is an error term.

This study will use panel data regression with the fixed effect model (FEM) approach as an approach in the analysis technique. According to Bell et al., (2019), FEM has various advantages—this analysis technique is able to control for unobserved constant effects between entities or, in this case, between countries, thereby reducing the potential for variable bias that is not listed in the model and providing more accurate estimates. FEM is also considered effective in overcoming emerging heterogeneities.

The fixed effect chosen is certainly not only based on the consideration of the model's advantages but also investigated through various tests. This study will use the Chow test, Hausman test, and Lagrange multiplier, which will support the researcher to choose the fixed effect as the method that best suits the research objectives. In addition, in support of the robustness of the model, this study will add a model stability test using a stationary, cointegration test, and all classical assumption tests, namely normality, heteroscedasticity, multicollinearity, and autocorrelation.

Results and Discussion

Development of Banking Stability

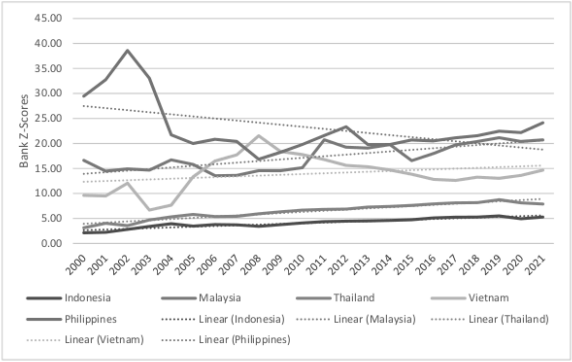
Banking stability shows an increasing trend in Vietnam, Malaysia, Thailand, and Indonesia. On the other hand, although the Philippines has the highest level of banking stability, it has declined over the past two decades (Figure 2). The Philippines has undergone significant banking reforms since the 1990s, after a period of very strict regulation. These

reforms include changes in capital regulations and increased bank capital restrictions, as reported by a World Bank survey (Manlagnit, 2015)this paper has examined the impact of Basel II on the cost efficiency of Philippine commercial banks from 2001 to 2011. The overall mean cost efficiency estimate is 0.75, indicating substantial inefficiencies in the banks averaging to 25% of total costs. Findings show that higher capital requirement tends to improve the cost efficiency but more powerful supervisors can adversely affect the efficiency of the banks. The other potential correlates that may help explain the efficiency of the banks are risk and asset quality and bank-specific variables. From a policy perspective, this study is informative to policymakers on the general direction in which to proceed with reforms (i.e., maintain higher capital requirements, curtail powerful supervisors, and enhance private monitoring. Although aimed at improving efficiency and reducing risk, rapid and frequent regulatory changes create uncertainty in the banking industry, resulting in high adjustment costs and operational strain. Increased capital restrictions can reduce banks' flexibility in managing portfolios, affecting profitability and long-term stability. In addition, external factors such as global economic fluctuations, political uncertainty, and financial market volatility also contribute to this downward trend in stability.

Malaysia showed the highest increase in banking stability. Malaysia is one of the most advanced Islamic banking centers in the world, with a government that actively supports and encourages the Islamic banking system (Lassoued, 2018). Although the debate over credit risk between Islamic and conventional banks is still ongoing, Malaysia has managed to create a relatively stable banking environment through effective supervision and comprehensive risk management policies.

Based on Figure 2, Vietnam has the third highest banking stability in terms of banking stability. Significant credit growth and stable financial market dynamics in Vietnam are considered to be factors influencing the country's high banking stability. In 2007, Vietnam has also joined the World Trade Organization. By joining the organization, Vietnam is quite reliable in boosting its economic growth. In addition, in the research Le et al. (2019), Vietnamese banks achieved structural reforms and liberalization; in this case, bank restructuring and the improvement of private banks.

Indonesia and Thailand have low banking stability, but trends over the past 20 years have increased. Thailand is the lowest-ranked and most financially unstable country, according to research Noman et al. (2018). International Monetary Fund - Monetary and Capital Markets Department (2019) also researched



Source: Data processed from World Bank, (2025b)

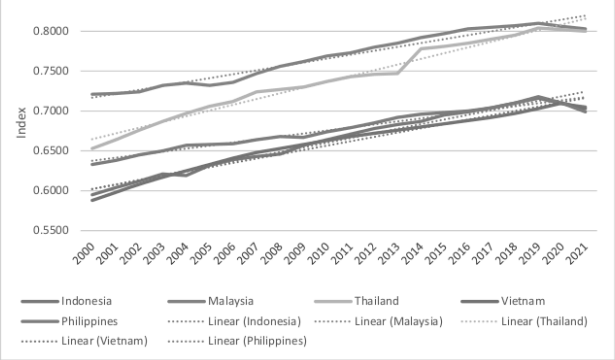
Figure 2. Development of Banking Stability in ASEAN

Thailand and found that the weakness of some companies and micro enterprises and the high household debt in Thailand also led to low banking stability in the country. Banking stability in Indonesia is relatively low compared to other ASEAN countries due to the banking sector consolidation process that began after the 1997 crisis and was officially launched through the Indonesian Banking Architecture (IBA) in 2004 (Mulyaningsih et al., 2016). Although consolidation aims to strengthen banks by increasing capital and managing risks, its impact on stability is not optimal. Consolidation can strengthen large banks but reduce competition, but reliance on this strategy without sweeping regulatory reforms hampers progress on stability.

Development of the Human Development Index

HDI showed a significant increase (Figure 3). In 2021, Malaysia, Thailand, Indonesia, and Vietnam were in the high HDI category, with scores between 0.700 and 0.799, whereas Vietnam was still in the middle category because it obtained a score of 0.6990. This increase reflects substantial progress in health, education, and living standards in these countries while signaling their success in addressing complex development challenges. This high HDI category reflects the ongoing efforts and effective policies implemented by the government to improve the quality of life and well-being of their population.

Malaysia and Thailand have the highest HDI in ASEAN due to their large investments in education and health. Malaysia focuses on strong basic education, whereas Thailand invests significantly in education and healthcare spending (Maneejuk & Yamaka, 2021) particularly higher education, on economic growth in the ASEAN-5 countries (i.e., Thailand, Indonesia, Malaysia, Singapore, and the Philippines. Malaysia's and Thailand's HDI scores are much higher than the average of countries in East Asia and the Pacific (0.749) as well as the global average (0.732). Malaysia has a high HDI due to consistent economic growth. Government policies that support human development also play an important role. However, HDI in ASEAN, including Malaysia, decreased slightly in 2020 due to the COVID-19 pandemic, which affected life expectancy and per capita income. During the economic crisis caused by the pandemic, banks faced challenges such as higher credit risk, declining lending, fluctuations in operating costs, inflationary impacts, and shifting consumer behavior (Hidayat et al., 2024). Thailand achieved an HDI score of 0.803 in 2022, showing progress from the previous year and ranking 66th globally. Women's HDI (0.807) is higher than men's (0.798), although income gaps and access to education remain (UNDP, 2024a). Although



Source: processed data from United Nations Development Programme, (2025)

Figure 3. Human Development Index in ASEAN

there has been significant progress, adjustments for carbon emissions are lowering HDI, and problems of social polarization and insecurity are hindering further progress (Chansarn, 2013).

Indonesia, Vietnam, and the Philippines show similar HDI trends. Indonesia has made progress in HDI, with life expectancy increasing to 71.7 years and the average expected school year to reach 13.6 years, comparable to the average in East Asia and the Pacific. The country's GDP per capita is USD 11,459. However, despite the increase in HDI, the planetary pressure-adjusted score (PHDI) dropped to 0.691, indicating a 3.8% decline from its initial score. This decline resulted in a downgrade in Indonesia's PHDI rating, which indicates a significant environmental impact (UNDP, 2020). Vietnam has shown considerable progress in HDI since 1990, with substantial improvements in education and life expectancy. Despite these advances, challenges such as gender inequality remain a challenge for all ASEAN countries. Access to education and labor force participation are increasing in Vietnam, but women's participation still faces gaps in employment opportunities and women's participation in leadership (UNDP, 2024b). The Philippines has made progress in the HDI from 0.598 in 1990 to 0.699 in 2021. The Philippines is currently ranked 116th in the world, 16th in Asia-Pacific, and 7th in ASEAN.

Descriptive Statistical Analysis

The results of descriptive statistics in this study are shown in Table 2. This table provides an understanding of the banking stability and HDI indicators in Malaysia, Indonesia, Vietnam, the Philippines, and Thailand. The number of observations in this study is 110 observations. The average banking stability proxied using the z-score of banks for the period 2000 to 2021 is 12.98. Meanwhile, the median value was slightly higher at 13.59. The range of BZS values varies widely, with a maximum of 38.58 and a minimum of 2.13. This shows a significant difference in the stability of the banking sector in the developing ASEAN region. A standard deviation of 7.70 indicates a relatively large variation in the data. A positive slope of 0.57 indicates a slightly skewed distribution towards a lower value. Kurtosis values close to 3 indicate a normal distribution.

Table 2

Descriptive Statistics

	BZS	HDI
Mean	12.98268	0.701627
Median	13.58834	0.697500
Maximum	38.57995	0.810000
Minimum	2.127169	0.588000
Std. Dev.	7.702451	0.057034
Curtosis	3.001905	2.293527
Jarque-Bera	5.899040	3.436139
Probability	0.052365	0.179412
Sum	1428.095	77.17900
Number of Sq. Dev.	6466.725	0.354560
Observation	110	110

Source: Author's calculation (2024)

The HDI showed an average of 0.7, indicating that almost all countries have a high category of HDI. Meanwhile, the average HDI score was slightly lower at 0.69. The HDI has a value range between 0.59 and 0.81. This shows the difference in the level of human development in ASEAN. A standard deviation of 0.057 indicates a relatively small variation in the HDI value. A positive slope of 0.25 indicates a slightly skewed distribution towards a higher value, whereas a kurtosis of 2.29 indicates a distribution that is close to the normal distribution. The Jarque-Bera test with a probability of 0.18 shows that the HDI distribution is close to the normal distribution.

Regression Estimation Results

Stationary testing is an important step in the analysis of time series data to ensure that the data used does not have trends or patterns that change over time so that the results of statistical analysis can be trusted. The stationarity test in Table 3 uses two methods—Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP)—to test the stationarity at the level and the first difference of the analyzed variables. BZS is not stationary at the level but becomes stationary after the first distinction is made, both by the ADF and PP tests. Meanwhile, the HDI variable has shown stationarity at the level based on the PP test but not

with the ADF. However, after the first difference, the HDI variable becomes stationary based on both tests. The stationary test shows the importance of making the first differentiation on non-stationary data to obtain valid analysis results.

Based on the cointegration of the test using Kao in Table 4, a probability value of 0.0013 or less than alpha 0.01, then H0 is rejected. Thus, the variables in the model have a long-term cointegration relationship.

In determining the best model, the selection of models through the Chow test and Hausman test shows that the fixed effect model is the most appropriate to use. The Chow test shows a probability value of 0.000, which means that the fixed effect model is better, whereas the Hausman test shows a probability value of 0.000, indicating that the fixed effect is better than the random effect. In conclusion, this study uses fixed effect as the best method.

HDI is positively and significantly correlated with influencing banking stability in ASEAN developing countries studied. An HDI coefficient of 26,750 indicates that an increase of one unit in HDI will lead to an increase in banking stability by 26,750 units, assuming the other variables are fixed or constant. A relatively small standard error of 1.319 compared to the coefficient suggests that this estimate is quite straightforward. This shows that developing countries in ASEAN with higher levels of human development tend to have more stable banking stability.

Based on Table 5, the results of the statistical test show that this panel data regression model is an excellent model for explaining the influence of HDI on banking stability in developing ASEAN. With an R-squared value of 0.949 and an adjusted R-squared value of 0.947, this model is able to explain about 94.7% of the variability of banking stability. The high R-squared in this result indicates that the independent variable (HDI) can explain most of the variation in the dependent variable (banking stability). This indicates that the relationship between HDI and banking stability is very strong, where increasing HDI, which includes aspects of education, health, and standard of living, has a significant impact on the quality and stability of the banking sector.

Table 3

Stationarity Test

Variable	Dickey Fuller Augmented		Phillips-Perron	
	level	1st Difference	level	1st Difference
BZS	14.1567	39.2059***	13.3486	66.4992***
HDI	15.4735	15.2510**	29.9038***	23.9299***

Source: Author's calculation (2024)

Table 4

Kao Residual Cointegration Test

	t-Statistic	Prob.
ADF	-3.022259	0.0013
Residual variance	4.142296	
HAC variance	3.664084	

Source: Author's calculation (2024)

Table 5

Estimated Results

Model Selection Test				
Chow Test				0.000
Hausman Test				0.000
Regression Results				
Variable	**Coefficient**	**STD error.**	**t-Statistics**	**Prob.**
C	-5.786385	0.926922	-6.242577	0.0000***
HDI	26.75077	1.319058	20.28021	0.0000***
Statistics				
R-squared	0.949442	Average dependent var		26.43325
R-squared adjusted	0.947011	S.D. depends on var		14.52048
F-stats	390.6097	Durbin-Watson Statistics		1.726546
Prob(F-stats)	0.000000			
Cross-sectional effects				
Indonesia_	-7.923009			
Malaysia_	2.755694			
Thailand_	-7.410711			
Vietnam_	1.936609			
Philippines_	10.64142			
Classic Assumption Test				
Normality Test			3.0358	0.2191
Autocorrelation Test				1.7265
Heteroscedasticity Test				0.0740
Multicollinearity Test				
	HDI		**BZS**	
HDI	1.0000		0.1081	
BZS	0.1081		1.0000	

Note: *, **, and *** indicate the level of significance at the 10%, 5% and 1% levels
Source: Author's calculation (2024)

The Durbin-Watson statistical value is 1.7265, meaning that there are no serious problems related to autocorrelation. These results confirm that HDI contributes significantly and positively to banking stability in the ASEAN region, with a very strong and reliable model that explains the relationship between independent and dependent variables. The heteroscedasticity result using Breusch-Pagan was 0.0740, meaning that there was no heteroscedasticity problem.

The results of the cross-section effect show that there is a variation in banking stability in ASEAN developing countries. Indonesia and Thailand have a negative and significant influence on banking stability, namely proxies using bank z-scores, indicating that conditions in both countries tend to weaken banking stability compared to other countries. In contrast, Malaysia and Vietnam showed positive influences, suggesting that factors in both countries favored better banking stability. Based on the cross-section effect, the Philippines shows the highest positive coefficient, which means that banking stability in the country is stronger compared to other ASEAN countries.

The Relationship Between Human Development Index Variables and Banking Stability

Although macroeconomic factors such as monetary policy, banking regulation, and global economic conditions have been widely discussed and considered adequate in explaining banking stability and resilience, the study also highlights the importance of HDI as an additional factor that has not been fully taken into account in previous studies. This study shows that HDI is positively and significantly correlated with influencing banking stability in ASEAN. The three main dimensions that make up the HDI value, such as the quality of education, health, and a decent standard of living, are statistically significant in strengthening the stability of the banking sector. If the country has a high HDI category, people tend to have achieved higher levels of education and income. This will increase public access to financial services, of course, with various government policies that emphasize financial literacy in the community. Not only that, a smarter society will be able to educate the people around them to start saving and using credit more wisely for productive activities. In such an effort, it will reduce non-performing loans measured in NPLs. This environmental and efficient banking condition will support increased banking stability. Thus, investment in human development is important for every country, not only for economic growth but also in an effort to strengthen the stability of the banking sector, which is a key pillar in maintaining overall economic stability, especially for emerging ASEAN.

Many developing countries experience significant economic inequality, characterized by substantial disparities between the rich and the poor (Nurhaliza et al., 2024). High banking stability plays an important role in achieving sustainable development. A sophisticated and stable financial system is an important foundation in supporting development financing and realizing the Sustainable Development Goals (SDGs) without poverty, healthy living, and quality education. Increasing HDI in ASEAN developing countries creates a more financially stable environment, which in turn facilitates financial institutions in supporting development projects aligned with the SDGs. Financial institutions operating in a stable financial system are more likely to invest in initiatives that support the SDGs goals. Financial stability, reflected in the increase in z-score banks, is critical to achieving the SDGs, which is in line with the findings of (Ozili & Iorember, 2023). This result confirms that investment in efforts to increase HDI not only strengthens the banking sector but also accelerates the achievement of the SDGs in the ASEAN region.

ASEAN countries showed HDI in the high category for Malaysia, Thailand, Indonesia, and the Philippines, indicating that their citizens have better access to financial services, better financial management, and more stable incomes, all of which contribute to reduced credit risk and improved banking portfolio quality. However, although HDI in ASEAN countries is relatively high, banking stability is still affected by various other factors such as risk management, banking regulation, and resilience to global economic fluctuations. In resource-rich countries, revenues from natural resources can be invested in sectors that support financial stability, such as renewable energy initiatives and education, which also contribute to the achievement of the SDGs (Luo et al., 2024).

The low banking stability in Indonesia and Thailand, despite the relatively high HDI of both countries, reflects economic complexity. Although high HDI indicates progress in the quality of education, health, and living standards, which should support banking stability, a number of structural and external

factors have weakened the banks' z-scores in both countries. Despite the increase in social aspects as measured by HDI, Indonesia is still heavily dependent on sectors that are vulnerable to global volatility, such as commodities. Indonesia is a country that relies heavily on the export of commodities such as crude oil, natural gas, and coal (Hidayat et al., 2023). Indonesia experienced significant net capital flows due to high banking liquidity excesses exacerbated by a decline in commodity prices in 2013 (Hudaya & Firmansyah, 2023). The high dependence on foreign financing also increases vulnerability to fluctuations in the rupiah exchange rate against the dollar until 2024, especially when global financial markets are still uncertain, such as during a period of uncertainty about the reduction of fiscal stimulus by the Federal Reserve. Thailand is also facing similar challenges. Despite Thailand's high HDI, its main economic sectors, including the tourism and export sectors, are particularly vulnerable to external shocks. Dependence on global demand and external conditions makes banking stability vulnerable to global economic fluctuations (Taskinsoy, 2020b).

Financial inclusion efforts in Indonesia, especially through digital transformation and various government programs, have played an important role in increasing HDI, which in turn can strengthen banking stability. Initiatives such as the establishment of the Regional Financial Access Acceleration Team (TPAKD) and the One Student One Account (OSOA) program aim to expand financial access among the community, including in rural areas and among women who are often marginalized (Setiawan et al., 2024)this study aims to investigate the factors influencing the behavioral intention to adopt Fintech from the perspective of Indonesian women. The research data were collected from 409 Indonesian female respondents and analyzed using the SEMinR statistical data analysis tool. Structural equation modeling (SEM. Thailand's efforts to increase financial inclusion focus on subnational development and strengthening the financial sector. The Asian Development Bank (ADB) plays an important role by supporting the Thai government in several aspects. ADB helps governments and the private sector to improve the competitiveness of micro, small, and medium enterprises (MSMEs) through better trade, cross-border investment, new technologies, and innovation (Asian Development Bank, 2021). In addition, ADB focuses on strengthening financial inclusion through microfinance development and special support for vulnerable groups such as women and disadvantaged communities, especially in poor provinces. These programs aim to improve financial access and financial management in areas with slow growth, including increased competence in the digital, agriculture, biotechnology, and automation sectors. These efforts support increased HDI by increasing access to education, health, and income, ultimately contributing to financial stability by creating a more inclusive and resilient economy.

Financial literacy in Malaysia has become the government's main focus to support SMEs. Through the SME Master Plan 2012-2020, the Malaysian government targets to increase the contribution of SMEs to the economy, but its performance is still below the ASEAN average (Whah & Lim, 2018)to assess policies and initiatives implemented for the development of Malaysian SMEs, from the Eighth Malaysia Plan (8MP).

In Vietnam, financial literacy is still low compared to other developing countries, so the use of official financial instruments is minimal, and illegal credit is still rampant. The government seeks to improve this through a comprehensive financial strategy and education reform by incorporating financial training into the curriculum at all levels of education (Nguyen & Doan, 2020).

In the Philippines, financial literacy rates are very low, placing them at the bottom of the rankings. Based on a 2021 survey from the Bangko Sentral ng Pilipinas (BSP), only 20% of Filipinos fully understand basic financial concepts. To address this problem, the Philippine government, through the BSP, seeks to improve financial education broadly to protect the public from financial risks such as predatory and high-interest loans (Bancoro, 2023).

In Indonesia, financial literacy and inclusion policies follow Indonesia's National Strategic Framework for Financial Literacy to improve public understanding and access to financial products (Christiani & Kastowo, 2023). This strategy includes education, increasing economic competence, and increasing access to finance. Although the financial literacy index has reached a fairly high level, there are still challenges, including the number of unlicensed financial institutions that are still used by the public.

In Thailand, financial literacy is still in the development stage, although many households have

internet access through smartphones and computers. The Thai government's efforts include financial education programs that aim to increase public knowledge about financial products and services. One of the key initiatives is the financial literacy program launched by the Bank of Thailand, which focuses on improving understanding of money management and financial planning (Phan et al., 2024). Constraints in Thailand, similar to Vietnam, include the digital divide and financial literacy that varies between urban and rural populations.

The Philippine banking system shows strong stability despite facing global challenges. Until the end of 2021, the banking sector showed positive growth, with an increase in assets driven by an increase in deposits. The bank's net profit increased significantly, with asset and equity returns remaining stable and showing good performance. Credit activity showed consistent improvement, with an increase in credit channeled to important sectors such as MSMEs. Asset quality was well maintained, as evidenced by the decline in the non-performing loan ratio and the improvement in the capital adequacy ratio. The bank's liquidity is also excellent, with the liquidity coverage ratio well above the minimum threshold. The Philippines is taking advantage of the pandemic to accelerate financial inclusion through digital transformation, with the target of increasing digital transactions and expanding financial access for more adults (Diokno, 2022). In addition, the Philippine government is encouraging sustainability by introducing regulations that mandate the application of sustainability principles in banking operations, including funding for green projects. These measures aim to strengthen the financial system and support inclusive and sustainable long-term economic growth.

The development of a dual banking system that includes Islamic and conventional banking has also encouraged increased banking stability in Malaysia. Malaysia is an international Islamic financial center that strengthened the banking sector after the 1998 Asian financial crisis (Ibrahim et al., 2019)

Malaysia also consistently ranks at the top of the list of credit facilities according to the World Bank's Doing Business report. Initiatives like this have the opportunity to increase financial access for the community, improve living standards, and improve financial stability. Meanwhile, Vietnam has improved banking stability as a result of structural reforms and liberalization. However, despite Vietnam's improving banking stability, there are challenges to low financial inclusion compared to other Asian countries. Efforts to expand access to banking services to MSMEs and communities in remote areas are expected to be the main driver of economic growth in improving human development (Hidayat et al., 2022).

Conclusion

The results of this study conclude that HDI has a positive influence on banking stability in Indonesia, Malaysia, the Philippines, Thailand, and Vietnam. Increased HDI, especially for countries with high HDI scores, is often associated with high levels of education, complete access to healthcare, and high living standards. This study covered developing countries in ASEAN because it has not been studied in depth. Four countries in ASEAN show a high HDI category, except for Vietnam. In addition to the dimensions of education, health, and decent living standards, high HDI also shows the potential of people with a high level of financial literacy, one of which is access to funding such as bank loans. With people who have high financial literacy, there is less possibility of bad loans and other banking problems. Banks can focus more on risk management and more innovative and inclusive financial development.

The highest HDI is in Malaysia, which is driven by the quality of life and adequate infrastructure, which contribute to a stable financial environment. On the other hand, Indonesia and Thailand have the lowest banking stability in ASEAN studied, suggesting that there are challenges to achieving banking stability. Based on these findings, there is a need for an approach to increase multidimensional HDI that will strengthen the financial sector, especially in Indonesia and Thailand. There is a need for financial institution policies like those carried out by central banks in each country, such as increasing financial literacy for students.

These findings show that in some ASEAN countries, an increase in HDI has the potential to support banking stability, but this is also influenced by other factors such as fiscal policy and banking sector management. Efforts to improve the skills of uneducated and educated workers will strengthen the banking sector by reducing the risk of bad loans

and improving asset quality. In addition, regional integration and ASEAN collaboration in terms of financial regulation and monetary policy formation can create a more coordinated and stable financial market.

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