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Analysis of financial inclusion and financial stability on economic development in APEC member countries

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ABSTRACT

Financial inclusion and financial system stability are important instruments in a country's economic development. Both financial systems are critical for developing countries to improve people's welfare, promote inclusive economic growth, and protect the financial system from shocks and crises. Financial inclusion is a measure of people's accessibility to financial products and services. Meanwhile, a stable financial system will accelerate the country's economy. Therefore, this research aims to determine the effect of financial inclusion and financial system stability on economic development in APEC member countries. The data used is in panel form using the Fixed Effect Model method. This paper takes 20 member countries of the Asia Pacific Economic Cooperation (APEC) as the research object, collect the data from 2008 to 2021. The research results show that financial inclusion has a significant effect on the economy on the penetration and usability y proxies, while the availability proxy is not significant. Furthermore, the Bank Z-score as an indicator of financial system stability also has a significant influence on the economy, followed by two additional variables, namely inflation and the Financial Development Index. The conclusion is that financial inclusion and financial system stability have a positive influence on a country's economic development. Implications of this study suggest that the bank has to expand the network in the financial sector that the community can reach, then make people believe and be confident to create accounts so that people can conduct financial transactions easily and efficiently that help to improve the economy.

1. Introduction

The financial sector plays a role in spurring growth, equalizing income, resolving poverty, and creating financial system stability through its intermediation function (Umar, 2017). It can also facilitate capital mobilization for high-yield projects through the financial intermediation process and ensure efficient allocation of financial resources between borrowers and lenders (Malik et al., 2022). The financial sector has dynamics that are closely related to how the financial system carries out its functions. In the financial system, there are actors, products, policies, and processes in which activities take place (Adriani & Wiksuana, 2018). The financial system is a foundational pillar of the economy through its role in providing more space for economic actors in transactions (Adriani & Wiksuana, 2018). Therefore, the financial system is one of the parameters that needs to be considered in decision-making process.

Another financial sector policy that also has a vital role in realizing the country's growth and economy is financial inclusion. Financial inclusion is defined as the ability of individuals and

businesses to access valuable and affordable financial products and services to meet their needs, such as making transactions, making payments, saving, borrowing, and insuring themselves (World Bank, 2022). Financial inclusion provides several positive effects, such as being able to expand the banking asset portfolio to enrich investment types, motivating people to save more funds so that the basic stability of savings increases, reducing the risk of market fluctuations, and helping the transmission of monetary policy (Hardiyanto & Arianti, 2019). Financial inclusion is important in helping developing countries integrate previously financially marginalized populations into the formal financial system. It enables them to access financial products and services that can improve their financial stability, reduce poverty, and bridge income gaps. As such, financial inclusion contributes significantly to improving people's social welfare (Khan & Khan, 2023). Apart from that, financial inclusion also has several negative effects on the stability of the financial system, such as resulting in a reduction in credit standards, which allows financial institutions to be accessed by the lower classes. the un-bankable by reducing loan requirements; apart from that, it can reduce the bank's reputation because the government tries to lower standards for establishing financial institutions in villages; it can also result in instability due to exclusive and complied regulations from microfinance institutions (Hardiyanto & Arianti, 2019).

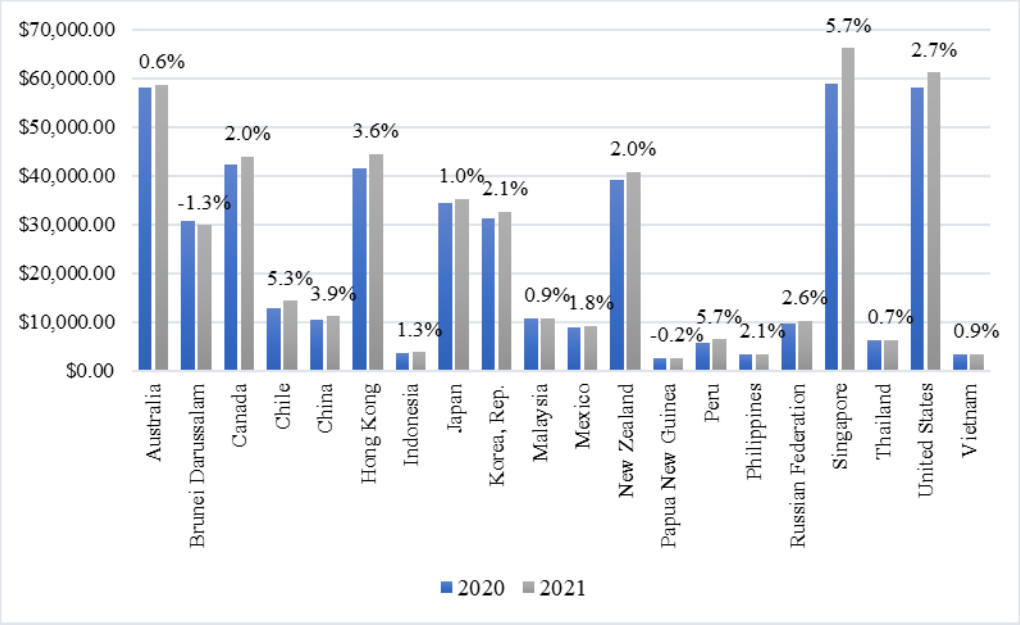

Figure 1. Gross Domestic Product Per Capita by Countries from 2020 to 2021

Figure 1 shows, the majority of APEC member countries experienced an increase in GDP per capita in the second year after the outbreak. Remembering that in 2020, GDP per capita depreciated due to the COVID-19 pandemic that spread throughout the world, The improvement in the economy is allegedly due to the existence of strategic plans by each country to overcome the crisis. Many factors influence a country's economic growth, including financial institutions' development. Stronger economic growth in a region indicates greater development and a more vibrant economy (Nasir et al., 2021). To encourage GDP growth, the development of financial institutions can help expand the accessibility of banking services and consumption at all levels of society (Cheng & Degryse, 2010). One strategy for increasing access to finance in the community is to launch a financial inclusion program (Iramayasari & Adry, 2020). Financial inclusion is a crucial aspect of financial development, because it provides people access to affordable financial services and hence promotes economic growth (Chen et al., 2023).

For example, in Indonesia, the Financial Services Authority (OJK) responded to the crisis by encouraging inclusive finance so that public access to financial products and services could increase. Inclusive finance can be a solution for national economic recovery and improve people's welfare because people are able to use financial products and services according to their needs (OJK, 2021). Inclusive finance has been a concern of the Indonesian government long before the pandemic occurred. In 2016, the President of Indonesia implemented Presidential Regulation Number 82 of 2016 concerning the National Strategy for Inclusive Finance. The Indonesian government is trying to encourage the rate of growth, accelerate poverty reduction, and overcome gaps between individuals and regions in order to realize the prosperity of Indonesian society through financial inclusion

(Pemerintah Republik Indonesia, 2016). Asia-Pacific Economic Cooperation (APEC), through the Finance Minister Process (FMP), is also pushing the financial inclusion agenda in the region. Since 2015, FMP has been trying to build Asia-Pacific finance to be more inclusive so that it can be enjoyed by all elements of society in the region (Hernando, 2018). The APEC FMP prioritizes improving access to capital and markets, particularly for small businesses, which account for more than 97 percent of firms and half of employment in APEC economies. It also develops and links credit information bureaus among APEC economies to provide available credit information on potential borrowers, enabling more accessible risk analysis and faster access to finance (Hernando, 2018).

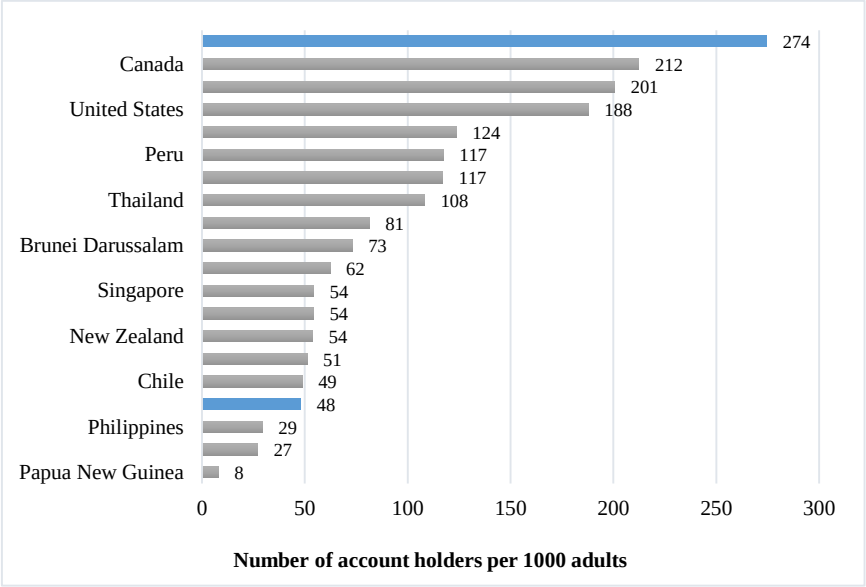

Figure 2. Banking Penetration in APEC Economies in 2021

Figure 2 illustrates how banking penetration is in each of the APEC economies. Banking penetration is the number of account holders in a country. In graph 1.2, it can be seen that per 1000 adults, there are 274 account holders in South Korea. This value makes South Korea the country with the most account holders of all APEC participants. This can be indicated by South Korea being a developed country with a high GDP per capita income. Meanwhile, Indonesia has the fourth lowest number of account holders of all APEC economies. Papua New Guinea has the lowest number of account holders, with eight people per 1000 adults.

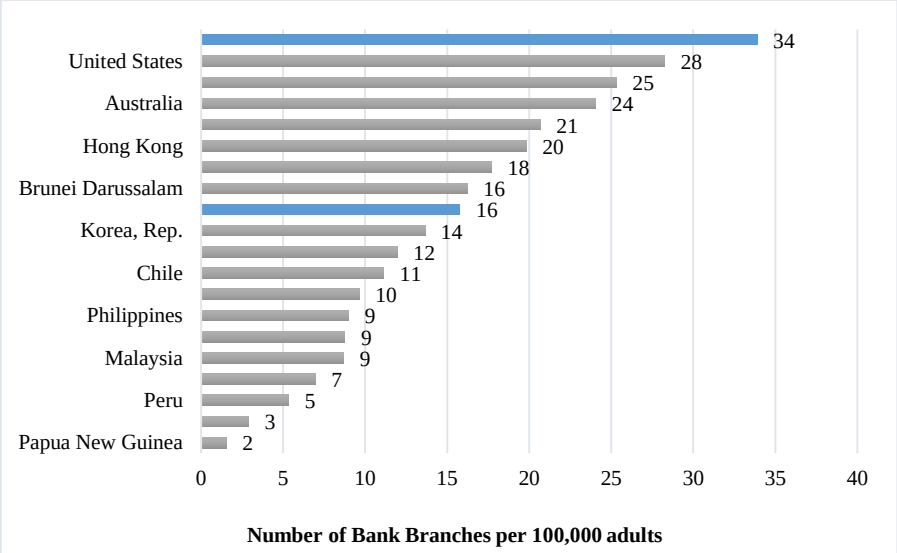

Figure 3. Banking Availability in APEC Economies in 2021

Figure 3 shows banking availability in each APEC participating country in 2021. Banking accessibility is the number of bank branches available in a country. As can be seen in Figure 3, there are 34 bank branches per 100,000 adults in Japan. This makes Japan the country with the highest bank

branches in all APEC economies. The lowest is Papua New Guinea, with only two bank branches per 100,000 adults. Meanwhile, in Indonesia, there are only 16 bank branches per 100,000 adults, indicating that banks are not evenly distributed throughout Indonesia. In fact, financial inclusion has a positive impact on the economy through the distribution of the number of commercial bank branches (Iramayasari & Adry, 2020). One function of banks is to move funds from individuals or financial institutions with surplus funds to those who need them, which is lubricant for the real sector economy. The ease of public access to banks will increase the possibility of banks mobilizing larger amounts of credit (Iramayasari & Adry, 2020). This will certainly encourage growth and increase investment in the real sector so that the economy can run well. This condition will increase the need for workers, thereby reducing unemployment and increasing people's per capita income (Anwar & Amri, 2017).

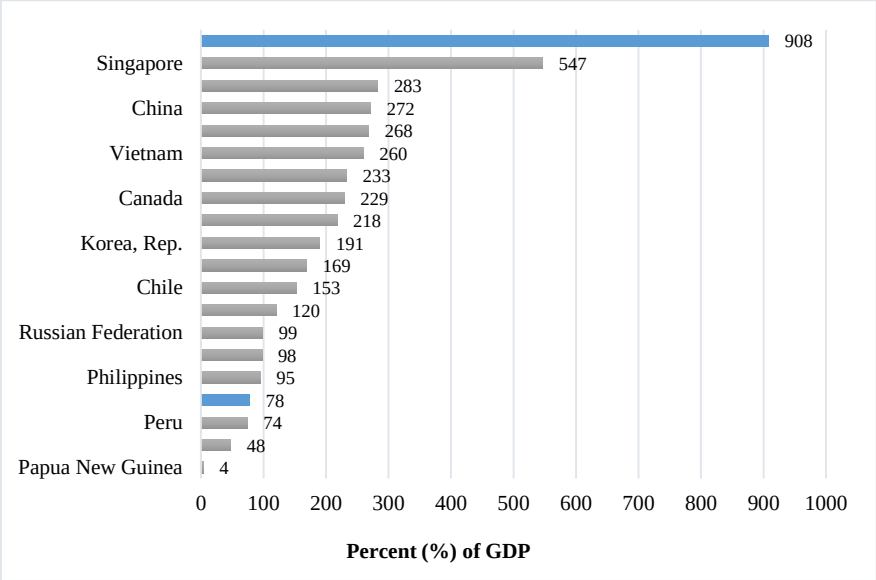

Figure 4. Banking Usability in APEC Economies in 2021

Figure 4 shows a comprehensive view of banking usability in each APEC participating country in 2021. Banking usability, which is the aggregate value of outstanding loans and outstanding deposits with a benchmark of each country's GDP value, is a significant measure of a country's financial health. As illustrated in graph 1.4, Hong Kong leads with the highest banking usability, amounting to 908% of the country's GDP or nine times the total GDP. In contrast, Indonesia's banking usability is only 78% of GDP, indicating a potential area for improvement. The lowest banking usability is observed in Papua New Guinea, where it is worth a mere 4% of the country's GDP, underscoring the need for enhanced financial services in the country. Credit distribution will actually help people improve their standard of living (Anwar & Amri, 2017). Easy credit will also encourage high interest in investment, thereby accelerating the economy. Apart from that, the availability of ATM machines will also encourage the economy through the faster circulation of money in society (Anwar & Amri, 2017). The existence of ATMs will make it easier for people to make payments or other economic transactions. Financial inclusion is able to boost the growth of MSMEs, which can be an accelerator for the economy (Adriani & Wiksuana, 2018). Even though easy access to financial services is said to be able to speed up the economy, caution is needed in its implementation.

APEC seeks to implement financial inclusion effectively and sustainably to ensure more people can use financial services, including the marginalized and those living in remote villages (Hernando, 2018). Addressing financial inclusion is of relevance as there are welfare benefits by having broader access to financial services (Esquivias et al., 2021). Although easy access to financial services is alleged to accelerate the economy, caution is needed in its implementation. Reflecting on the 2008 financial crisis caused by excessive credit accumulation in the United States, the entire world was affected, including the region. The world was affected, including the Asia-Pacific economies, dominated by developing countries. The phenomenon in 2008 contradicts theory, especially the theory of financial development. In this case, financial development, such as access, depth, and efficiency of the financial system, should encourage growth (Santoso, 2018). Therefore, researchers will further examine this phenomenon through this research.

Financial inclusion impacts economic growth and financial stability. Financial inclusion and financial stability usually coexist and complement each other. Financial stability will not be sustainable if a large proportion of the population is not included in the financial system. On the other hand, financial inclusion can jeopardize financial stability as not all users of financial services, particularly borrowers, are creditworthy, leading to credit and liquidity risks (Jima & Makoni, 2023). Financial stability is one of the factors that can affect economic growth and has been an important discussion in the empirical literature. This is important for monetary policymakers as such information allows them to undertake strategies that target and ensure financial stability. Unlike developed countries with options to mitigate risks, low-income countries are more vulnerable to the negative impacts of financial instability. Financial stability is an important indicator of economic development in developing countries, and it is a primary focus for regulators and policymakers, especially in developing countries (Feghali et al., 2021). Aduda & Kalunda (2012) conducted a study on financial inclusion and financial sector stability in the Kenyan economy. The study revealed that financial inclusion is a prerequisite for economic growth and development in Kenya, as various financial inclusion programs impact Kenya's financial stability. The relationship between financial stability and economic growth may be a two-way process. On the one hand, financial instability may hinder economic growth and development. Still, on the other hand, adverse real shocks may lead to financial instability, and both may reinforce each other. Banking failures, market liquidity shortages, and asset price volatility are examples of an unstable financial system. Financial instability disrupts real economic growth and negatively affects consumption and investment levels due to its close relationship with financial stability and development (Alsamara et al., 2019). Financial instability has been caused by many factors, one of which is the procyclicality of credit expansion (Widodo & Kurniawan, 2018).

This research contributes to the existing literature in the following ways. First, it presents a comprehensive analysis of the issues, providing strong evidence on the relationship between financial inclusion, financial stability and economic growth using global evidence and cross-country comparisons. Previous empirical studies have focused on individual economies to explore the relationship between financial inclusion and economic growth (Sharma, 2016; Ali et al., 2021; Dahiya, 2020). However, few studies have addressed the relationship between financial inclusion, financial stability, and economic growth (Ijaz et al., 2020; Oyamienlen, 2023; Stewart, 2019). Therefore, this paper examines the impact of financial inclusion and financial stability on economic growth in APEC economies. Second, we extend the existing research of Raza et al., (2019) and Alsamara et al., (2019) by including additional essential variables, such as inflation and the Financial Development Index, which may have a significant impact on the relationship between financial inclusion, financial stability, and economic growth in APEC economies. The results of this study are also useful for policy makers in APEC economies to implement appropriate policies related to financial inclusion and financial stability and provide room for policy debate.

2. Method

This research uses a descriptive method with a quantitative approach. Descriptive research is carried out to determine the value of variables independently, either one or more variables (independent), without comparing or connecting them with other variables (Sugiyono, 2012). A quantitative approach is used because the data in this research is in the form of numbers. The strategy used in this research is an experiment because the researcher wants to study the causal relationship between variables. The variables included in our analyses are gross domestic product per capita, inflation, Financial Access Survey (FAS) data, which consists of penetration, availability, and usability, Financial Stability Indicator (FSI) in this case is the Bank Z-score, which is plotted as an indicator of financial system stability, and the Financial Development Index (FDI). We obtained our data from the World Bank and the International Monetary Fund (IMF). APEC, an institutionalized forum of 20 sovereign nation-state-based economies, opens up various opportunities for developing countries to advance economically. This encourages the need for an in-depth study of financial inclusion and financial stability in APEC member countries.

There is a wide range of measures for financial inclusion. We use three important things, including banking penetration, availability of banking services and use of banking services. Based on the research conducted by Sharma (2016) in India, that there is a positive association between economic growth and various dimensions of financial inclusion, specifically banking penetration, availability of banking services and usage of banking services in terms of deposits. Along the same lines, Siddiki &

Bala-Keffi, (2024) in their research revealed the positive impact of financial inclusion on economic growth in high-income countries, middle-income countries, and low-income countries. These results show that the magnitude of the impact of financial inclusion depends on a country's income level. In addition, research from Ijaz et al., (2020) provides the results of the banking stability coefficient (Z-score), which is positive and statistically significant in terms of economic growth. This study found strong evidence that banking stability is crucial for economic growth, especially during times of crisis. Economic growth declined during the global financial crisis and periods of local banking crises. Moreover, an increase in financial stability would neutralize the negative impact of the crisis on economic growth. Further, Esquivias et al., (2021) finds financial access, measured either by the IMF access indicators, households access measures, or firms access measures, are positive and statistically significant in affecting economic growth in the MENA region, using the Arellano-Bover/Blundell-Bond Dynamic Panel System GMM methodology and the data from 23 EMs and 21 MENA countries over the period 2002-2015. Flores & Torre, (2024) in their research shows that inflation has a negative influence on the country's GDP per capita growth rate. According to the study, an environment of greater price stability is reflected in lower inflation rates, as this creates an environment of greater stability and certainty for economic agents. Such stability encourages private investment and spending, and with it, greater economic growth. Oroud at al., (2023) have also studied the impact of financial development on economic growth by using the ADRL model to estimate the long run and the ECM model to estimate the short run in Jordan from 1990 to 2020. The estimation results of both models show that there is a positive effect of financial development variables on economic growth. These results indicate that financial development is very important for increasing Jordan's economic growth.

This research used the panel data. Panel data is a combination of time series data with cross-section data, where the cross units used are measured over different time periods. The time series data in this research is annual data that took place in 2008–2021. Meanwhile, the cross-section unit used is the 20 member countries of the Asia-Pacific Economic Cooperation (APEC). The equation used in the panel data model in this study is as follows:

$$LnGDP_{it} = \beta_0 + \beta_1 PEN_{it} + \beta_2 AVA_{it} + \beta_3 USB_{it} + \beta_4 BZS_{it} + \beta_5 INF_{it} + \beta_6 FDI_{it} + \varepsilon_{it} \quad (1)$$

Where $LnGDP$ is proxy for income in APEC member countries using GDP percapita in this study; PEN is penetration; AVA is availability; USB is usability; BZS is bank z-score; INF is inflation; FDI is foreign direct investment; β_0 is constanta; $\beta_1 - \beta_6$ is the coefficient of independent variables; ε is error term; i is notation for cross-section and t is time-series. In panel data, there are three approach methods that are commonly used, the use of which is adjusted to the model specification test. The three models consist of the Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM), where in the three models there are only differences in the correlation between the error component and the independent variable (Gujarati, 2004).

3. Results and Discussion

First, carry out a model specification test to ensure that the selected regression model fits the available panel data structure. The panel data structure can consist of several observation units measured several times. Furthermore, a test must be conducted to determine which panel data model is the best: common effect, fixed effect, or random effect. Model specification tests can be conducted using various techniques, such as the chow test and hausman test. Table 1 shows that the F and Chi-square probability values for chow test have a value of 0, or less than 0.05. So, based on the results of this test, it can be assumed that the fixed effect model is a better model than the common effect. Diagnostic tools in Table 1 that the random cross-section probability value has a value of 0.0001, or less than 0.05. So, based on the results of this test, it can be assumed that the fixed effect model is a better one than the random effect model. Based on Table 1, this study will apply the FEM.

Table 1 for FEM that the banking penetration variable has a significant effect on GDP per capita. This can be known from the probability values of t-statistic 0.0000 < 0.05 and t-count 5,974 > t-table 1,6504. Then the variable availability of banking services does not have a significant effect on GDP per capita. This can be seen from the t-statistic probability value of 0.2453 > 0.05 and t-count 1,1646 < t-table 1,6504. Furthermore, the variable of the use of banking services (usability) has a significant positive influence on GDP variables per capita. This can be seen from the t-statistic probability value of 0.0000 < 0.05 and the t-count of 6,0575 > t-table 1,6504. The Bank Z-score variable has a

significant positive influence on GDP per capita, with the known value of the t-statistic probability 0.0348 < 0.05 and t-count 2,1222 < t-table 1,6504. Whereas inflation has a significant negative impact on GDP per capita. The last variable is the financial development index, where this variable has a significant positive influence on GDP per capita.

Table 1. Result of Panel Data

Variables	CEM		FEM		REM	
	Coef	Prob	Coef	Prob	Coef	Prob
C	7.471	0.000	8.662	0.000	8.521	0.000
PEN	0.004	0.000	0.002	0.000	0.002	0.000
AVA	0.039	0.000	0.003	0.245	0.005	0.040
USB	0.166	0.000	0.095	0.000	0.101	0.000
BZS	0.029	0.000	0.006	0.035	0.006	0.016
INF	-7.172	0.000	-1.417	0.000	-1.431	0.000
FDI	0.784	0.007	0.706	0.000	0.850	0.000
Diagnostic Tools						
Chow Test			0.000			
Hausman					0.000	

Source: data processed

banking penetration has a positive influence, as marked by the coefficient value of 0.0020. So, if a country has increased the value of banking penetration by 1 unit, then the acquisition of GDP per capita in the country will increase by 0.0020%. This means that more and more people use banking services, so they can help increase GDP per capita in the country. The results of this estimation are in line with Anwar & Amri (2017) research, which says that banking penetration makes it easier for the public to access their money anytime and anywhere. This can help improve efficiency and make it easier for people to conduct transactions. This can also encourage economic productivity to grow rapidly, given the existence of ATMs that help MSMEs by increasing their access to money and facilitating transactions (Anwar & Amri, 2017). Banking penetration can also help increase economic growth by allowing more people and businesses to access capital to start or develop their businesses. Meanwhile, banking availability has no significant influence on the GDP per capita of the country. The existence of bank branches does not always have a significant influence on the economy. The number of bank branches does not always reflect banking penetration in a country. For example, a country may have many bank branches, but the level of access to financial services is still low. So, the existence of bank branches does not always have a significant influence on the economy, but it can be influenced by other factors that also affect the economic conditions of a country.

Similar to banking penetration, the use of banking services (usability) also has a significant positive influence on GDP per capita. Table 1, the use of banking services has a positive coefficient value of 0.0950. This means that if the value of the use of banking services has increased by 1 unit, then the acquisition of GDP per capita has increased by 0.0950%. That way, it means that the increasing number of people using banking services can encourage an increase in GDP per capita in a country. The results of this estimate are comparable to the findings delivered by Anwar & Amri (2017), who, in their research, said that the use of banking services such as credit provided positive implications for the economy. The higher the bank's channeling of credit to the public, the better the standard of living in the community by opening up opportunities. In addition, the existence of credit can also increase investment, which is a driver and important factor in the economy (Anwar & Amri, 2017). The use of banking services has a significant contribution to the country's economy. For example, in terms of credit, credit access is very important for the economy because it can help increase economic activity and economic growth. Easy credit access can help increase investment in various economic sectors, such as industry, trade, and others.

Bank Z-Score has a coefficient value of 0.0057 and a positive value. That is, if the value of the Z-Score bank increases by 1 unit, then the GDP per capita will also increase by 0.0057%. Thus, it means that if the Bank Z-Score or the ability of the bank in avoiding bankruptcy has increased, it can help increase GDP per capita in the country. High Z-Score Bank will make a positive contribution to the economy through financial stability, investor confidence, credit, and the distribution of funds, as revealed by Altman (1968) as the inventor of this variable. Countries with a high Z value have a more stable and more trusted financial tendency by investors, so that it can attract more investment capital that helps the economy to continue to grow. While inflation recorded has a negative influence on GDP

per capita, if inflation increases by 1%, then the acquisition of GDP per capita in the country will decrease by 14,173%. This means that inflation is an obstacle or problem in the economy of a country. The results of this estimation are in harmony with the theoretical views expressed by Simanungkalit (2020), which state that inflation has a negative and significant influence on the economy. The presence of inflation is dangerous for recording in a country. Increasing inflation can reduce the purchasing power of people because the price of goods and services used by the community will continue to rise.

Financial development also has a positive influence on GDP per capita; the estimated results are in line with the theory put forward by Kunanti & Adry (2020) in their research, which says that financial development has an influence and significant on the economy. Financial development has a role as a financial intermediary, which is to offer investment so that it can increase the pace of the economy. Financial development can help encourage innovation, especially for companies that want to develop new products or technology. Because the high financial development index illustrates the progress that occurs in a country's financial system, which is marked by the level of sustainability and efficiency of the financial system, so that companies can easily access sources of funds from various economic sectors. Financial development also encourages financial system stability and provides a positive contribution to the financial sector as a whole. On that basis, financial development will be an acceleration for the economy in a country.

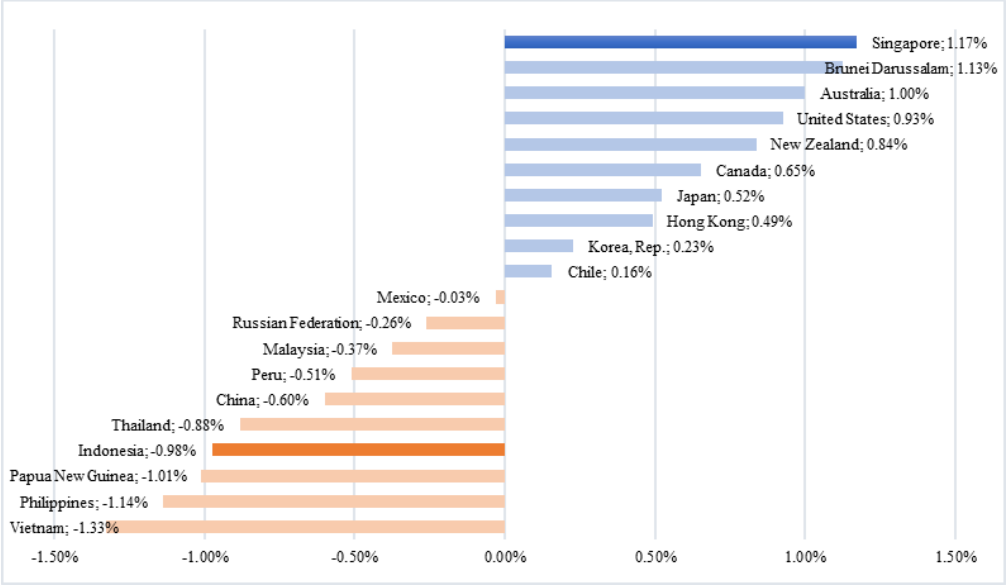

Figure 5. Intercept for each cross-section

Figure 5 is a visualization of the intercept value of each cross-section unit. The highest interception value was won by Singapore, with an intercept value of 1.17%. This means that GDP per capita in Singapore during the study year has a greater value compared to other countries. While the lowest intercept value won by the state of Vietnam is -1.33%, During the study year, GDP per capita in Vietnam is very low compared to other countries, so it makes Vietnam the last order. Indonesia itself won third place above Vietnam, but very far below Singapore. The intercept value achieved by Indonesia is -0.98%, which means that Indonesian GDP per capita is still low.

4. Conclusion

Our research, conducted across APEC participating economies from 2008 to 2021, underscores the crucial role of financial inclusion. Specifically, we found that banking penetration and the usage of banking services, key indicators of financial inclusion, have a substantial and positive impact on GDP per capita. These findings are of significant importance for policymakers, economists, financial institutions, and researchers alike. This research reveals the important role of financial inclusion in financial development. Therefore, it is clear that financial inclusion is an integral part of social banking and an essential parameter in financial development in any economy. In addition, financial stability, which is Bank Z-Score, has a positive and significant influence on GDP per capita. This means that if a country's bank's ability to avoid bankruptcy in the form of Bank Z-Score increases, GDP per capita will also increase. The financial development index also positively and significantly affects GDP per

capita. This means that if a country's financial development index increases, the country's GDP per capita will also increase.

Implications of this study suggest that the bank has to expand the network in the financial sector that the community can reach, then make people believe and be confident to create accounts so that people can conduct financial transactions easily and efficiently that help to improve the economy. The bank also needs to provide a variety of banking service products that can be easily used by the community, such as credit with low interest so that the community can invest, and the role of the government as a facilitator. High investment can help improve the economy. The central bank provides, supervises, and maintains the health of existing banks to avoid bankruptcy. In addition, the existence of a Z-Score bank is also a reference that investors trust to invest, which helps finances and encourages an increase in the economy. Finally, the government should be advised on efforts that can be made to overcome or suppress inflation rates with fiscal and monetary policies. Besides that, the government can also regulate to increase production results, stabilize the level of community wages, make maximum prices, and conduct supervision and distribution of goods. That way, inflation is expected to be adequately resolved so that it does not interfere with the slow economy. The government is also expected to increase the efficiency and stability of the financial system by increasing supervision and regulations, developing inclusive financial products, and improving the quality of financial services.

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Declarations

Author contribution	:	All authors contributed equally to the main contributor to this paper. All authors read and approved the final paper
Funding statement	:	Collaborative research from lecture in department of economics UAD and student of PhD in Chulalangkorn University
Conflict of interest	:	The authors declare no conflict of interest.
Additional information	:	No additional information is available for this paper.

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