THE IMPACT OF FINANCIAL TECHNOLOGY ON FINANCIAL STABILITY: THE ROLE OF MACROPRUDENTIAL POLICY TO MITIGATE SYSTEMIC RISK

ARRANGED BY :

ALVIAN DWI CHANDRA
NIM 20108010049

SUPERVISOR :

RISWANTI BUDI SEKARINGSIH, M.Sc.
NIP. 19851009 201801 2 001

SHARIA ECONOMICS STUDY PROGRAM

FACULTY OF ISLAMIC ECONOMICS AND BUSINESS

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UNIVERSITAS ISLAM NEGERI SUNAN KALIJAGA
FAKULTAS EKONOMI DAN BISNIS ISLAM
Jl. Marsda Adisucipto Telp. (0274) 550821, 512474 Fax. (0274) 586117 Yogyakarta 55281

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yang dipersiapkan dan disusun oleh:

Nama	: ALVIAN DWI CHANDRA
Nomor Induk Mahasiswa	: 20108010049
Telah diujikan pada	: Selasa, 12 Desember 2023
Nilai ujian Tugas Akhir	: A

dinyatakan telah diterima oleh Fakultas Ekonomi dan Bisnis Islam UIN Sunan Kalijaga Yogyakarta

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A. Konsonan Tunggal

Huruf Arab	**Nama**	**Huruf Latin**	**Keterangan**
ا	Alif	Tidak dilambangkan	Tidak dilambangkan
ب	Bā’	B	Be
ت	Tā’	T	Te
ث	Ṡā’	Ṡ	Es (dengan titik di atas)
ج	Jīm	J	Je
ح	Ḥā’	Ḥ	Ha (dengan titik di bawah)
خ	Khā’	Kh	Ka dan ha
د	Dāl	D	De

ذ	Żāl	Ż	Zet (dengan tiitk di atas)
ر	Rā’	R	Er
ز	Zāi	Z	Zet
س	Sīn	S	Es
ش	Syīn	Sy	Es dan Ye
ص	Ṣād	Ṣ	Es (dengan titik di bawah)
ض	Ḍād	Ḍ	De (dengan titik di bawah)
ط	Ṭā’	Ṭ	Te (dengan titik di bawah)
ظ	Ẓā’	Ẓ	Zet (dengan titik di bawah)
ع	‘Ain	‘	Koma terbalik diatas
غ	Gain	G	Ge
ف	Fā’	F	Ef
ق	Qāf	Q	Qi

ك	Kāf	K	Ka
ل	Lām	L	El
م	Mim	M	Em
ن	Nūn	N	En
و	Wāwu	W	We
ه	Hā’	H	Ha
ء	Hamzah	`	Apostrof
ي	Yā’	Y	Ye

B. Konsonan Rangkap karena Syaddah Ditulis Rangkap

متعدّدة	Ditulis	*Muta’addidah*
عدّة	Ditulis	*‘iddah*

C. Konsonan Tunggal

Semua ta’ marbuttah ditulis dengan h, baik berada pada kata tunggal ataupun berada di tengah penggabungan kata (kata yang diikuti oleh kata sandang “al”). Ketentuan ini tidak diperlukan bagi kata-kata arab yang sudah terserap dalam bahasa Indonesia, seperti shalat, zakat dan sebagainya kecuali dikehendaki kataaslinya.

حكمة	Ditulis	*Hikmah*
علّة	Ditulis	*'illah*
كرمة الأولياء	Ditulis	*Karamah al auliya'*

D. Vokal Pendek dan Penerapannya

Semua ta' marbuttah ditulis dengan h, baik berada pada kata tunggal ataupun berada di tengah penggabungan kata (kata yang diikuti oleh kata sandang "al"). Ketentuan ini tidak diperlukan bagi kata-kata arab yang sudah terserap dalam bahasa Indonesia, seperti shalat, zakat dan sebagainya kecuali dikehendaki kataaslinya.

--- َ ---	Fathah	Ditulis	*A*
--- ِ ---	Kasrah	Ditulis	*I*
--- ُ ---	Dammah	Ditulis	*U*

فعل	Fathah	Ditulis	*Fa'ala*
ذكر	Kasrah	Ditulis	*Żukira*
يذهب	Dammah	Ditulis	*Yażhabu*

E. Vokal Panjang

Fathah + alif	Ditulis	*Ā*
جاهليّة	Ditulis	*Jāhiliyyah*
Fathah + ya' mati	Ditulis	*Ā*
تنسى	Ditulis	*Tansā*
Kasrah + ya' mati	Ditulis	*Ī*

كريم	Ditulis	*Karīm*
Dhammah + wawu mati	Ditulis	*Ū*
فروض	Ditulis	*Furūḍ*

F. Vokal Rangkap

Fatḥah + yā’ mati	Ditulis	*Ai*
بينكم	Ditulis	*Bainakum*
Fatḥah + wāwu mati	Ditulis	*Au*
قول	Ditulis	*Qaul*

G. Vokal Pendek yang Berurutan dalam Satu Kata Dipisahkan denganApostrof

أأنتم	Ditulis	*A’antum*
أعدت	Ditulis	*U’iddat*
لئن شكرتم	Ditulis	*La’in syakartum*

H. Kata Sandang Alif + Lam

1. Bila diikuti huruf *Qamariyyah* maka ditulis menggunakan huruf awal “al”.

القرآن	Ditulis	*Al-Quran*
القياس	Ditulis	*Al-Qiyas*

2. Bila diikuti huruf *Syamsiyyah* maka ditulis sesuai dengan huruf pertama

   Syamsiyyah tersebut.

السماء	Ditulis	*As-Samā’*

ال شّمس	Ditulis	*Asy-syams*

I. Penulisan Kata-Kata dalam Rangkaian Kalimat

Ditulis menurut penulisannya

ذوي الفروض	Ditulis	Zawī al-furūḍ
أهل ال سّنة	Ditulis	Ahl as-sunnah

HALAMAN MOTTO

Live with Integrity, the Norms of the law and also build Credibility,
then success will come readily to you

HALAMAN PERSEMBAHAN

Segala puji syukur kehadirat Allah SWT, atas segala rahmat dan nikmat-Nya yang tiada terhingga. Hanya atas izin-Nya lah segala kebaikan dapat terselesaikan.

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Skripsi ini saya persembahkan untuk keluarga, sahabat, teman dan kemajuan ilmu pengetahuan global

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Yogyakarta, 07 Desember 2023

Author,

(Alvian Dwi Chandra)

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ABSTRACT

The current development of FinTech raises concerns for the stability of the financial system in Indonesia. This study aims to see the effect of the variables Macroprudential Liquidity Buffer (MLB), Total Credit Disbursed, Capital Adequacy Ratio, and Total ATM on Z-score in the 10 banks with the largest to smallest market capital with a range of years 2018-2022. By using Panel Data analysis techniques through the Random Effect Model (REM) approach, the findings of this study explain if the Total Credit Disbursed and Capital Adequacy Ratio variables have a positive influence on Z-score. meanwhile MLB and Total ATM has no influence on Z-score, so regulators need to evaluate the value of the minimum MLB in order to be effective in maintaining financial system stability.

KEYWORDS : FinTech Development, Financial Stability, Z-score, Credit Risk, Liquidity Risk, Macroprudential Liquidity Buffer (MLB).

CHAPTER I

INTRODUCTION

1.1 Background

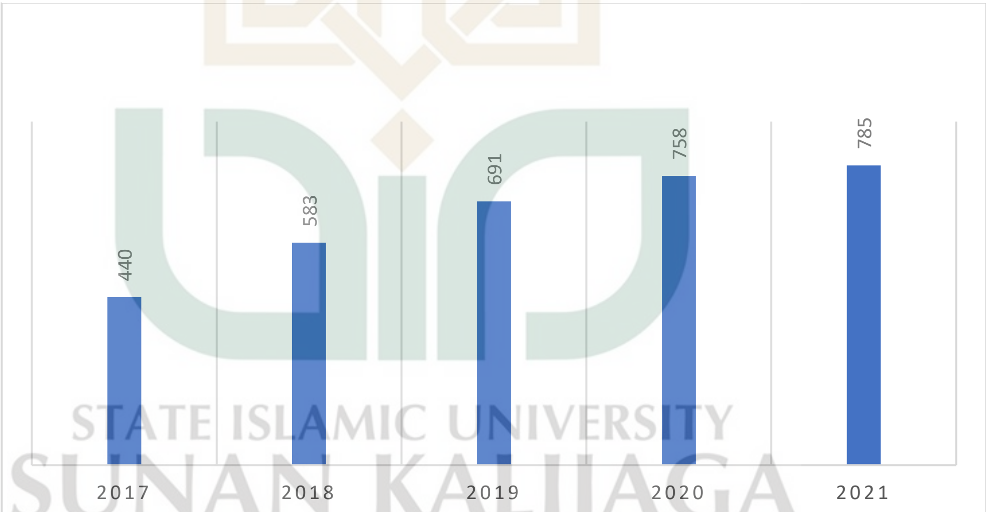
The rapid growth of Financial Technology (Fintech) in the global market has influenced the pattern of economy and financial system. Fintech provides a system model that is efficient and effective in terms of time and cost. This fintech service innovation has spread to all areas of financial services such as retail or wholesale payments, investment management, insurance, increasing equity capital and providing credit. Luo et al., (2022) stated that fintech not only promotes bank products, but also competes in competing with conventional banks. Although fintech offers many benefits, such as easy access to finance, cost efficiency, and product innovation. Its emergence also poses several systemic risks that can affect high financial stability as the need for an efficient financial system grows. Global and domestic authorities are starting to realize that the growth of fintech is very vulnerable to disrupting financial stability, which is influenced by internal and external factors. Fintech needs to be managed and monitored to avoid risks to financial stability.

Macroprudential policy is one of the policies that mitigate risks related to financial system instability caused by the growth of fintech. The scope of macroprudential policy can be said to be more comprehensive. The financial crisis did not only originate from issues in the financial services industry, but also stemmed from macroeconomic conditions. Macroprudential Policy includes risk prevention and management measures, such as increasing supervision and regulation of non-bank financial institutions, increasing financial literacy, as well as increasing the capacity and monitoring of the financial system as a whole (Bernier & Plouffe, 2019). One set of macroprudential policies used is the Macroprudential Liquidity Buffer. This instrument serves as a mandatory reserve of cash or easily convertible assets that banks are required to maintain. The purpose is to fortify banks against unexpected liquidity disruptions, such as a sudden surge in withdrawals or a decline in the value of their assets.

For the Indonesian government, the phenomenon of rapid fintech growth requires policy makers to formulate a strategy regarding regulation and find out the implications of this huge fintech growth for the economy and financial system security. In 2019, the industrial sectors experienced a decline or downturn due to the COVID-19 pandemic. This impact on the industrial sectors is discussed in research by Didier et al., (2020) and Fu & Mishra, (2022). Additionally, there is concern about the bias related to the duration and magnitude of the pandemic's impact, which has the potential to lead to a prolonged recession and worsen financial stability. Majid and Jamaluddin (2022) said the covid-19 pandemic had a tremendous influence on increasing fintech. Financial technology provides a very fast rate of recovery in the economic sector, this is because fintech is able to accelerate financial inclusion for easily accessible financial services.

Currently there are several FinTech start-ups that have a valuation of more than $1 billion in Indonesia. The largest transaction value actually comes from e-commerce. In the first quarter of 2022 the value of transactions that occurred was IDR 108.54 trillion, 23 percent higher than the previous year in the same period. This increase in transaction value apparently occurred due to the ongoing collaboration between digital payments and e-commerce provide easy transactions and other benefits. The following is a graph of FinTech growth in Indonesia:

Figure 1 FinTech Growth in Indonesia From 2017-2021



Source : UOB, PwC and SFA (September, 2021)

According to the Central Bureau of Statistics, Indonesia has a population of 275 million people, which makes this country a category with a relatively large economy globally. This makes the contributors to the growth of financial technology companies from 2017 to 2021 increase rapidly. The growth of fintech in Indonesia can be seen in figure 1, In 2017 there were 440 fintech companies in Indonesia, which in the following year grew significantly by 32.5%. Thus, this rapid development puts Indonesia in the position of the best financial market development in Asia. Furthermore, Aftech (Association Financial Technology) reviewed that Fintech lending in aggregate has distributed funding reaching IDR 476.89 trillion to 92 million borrowers per year by 2022. Then, as reported by Bank Indonesia, they are targeting the transaction value in the fintech sector itself to touch USD 28 trillion in 2027. Indonesia is optimistic that the gross transaction value in its digital payment sector will reach USD 266 billion by 2025, and USD 431 billion by 2030. This shows that there is a lot of optimism about the potential of fintech to make a positive contribution to the financial sector and become a major player in the global financial world. Fintech is very important and is expected to disrupt conventional banks, which are often seen as slow and expensive (Lee & Shin, 2018).

Research from the Toronto Centre (2017) reviews four ways in which fintech is having a major impact on the financial sector. First, fintech creates a lot of high competition so that funding democracy is created. Second, the growth of innovation makes costs more efficient. Third, there are investment opportunities that occur when involved in fintech financing by bank institutions or insurance firms. Fourth, the rapid and effective flow of data and information development builds the image that fintech is one of the financial supervisors. Complex data sets can be analyzed quickly using systematic optimization of computer engines. This is considered better to avoid human error that may occur in miscalculations (Ramlall, 2018). Lee & Shin (2018) disclose fintech based on Business model, application technology, operations and product innovation in fostering technology-based financial innovation with lower cost of use and efficiently connecting industry sectors (FSB, 2017).

Technology financial services have 5 categories, including Digital Banking, Crowdfunding, Payment Systems, Digital Insurance and Peer-to-Peer Lending. D. W. Arner et al., (2020) stated that the main contributors to Fintech today are based on percentage payments (43%), followed by lending (17%), and others in the form of crowdfunding and aggregators. The use of fintech in the process of economic activity creates benefits for various parties. Fintech has an important role in accelerating the reach of financial services. This role maximizes fintech in the use of technology in transaction processing and reduces physical evidence for reasons of security, practicality and is considered more modern. The potential advantages of online banking are low operational costs, ease of obtaining real-time information, establishing more smooth communication, more comfortable interaction between customers and prospective customers, as well as the added value of having access to professional knowledge in the financial world.

Financial stability is the ability of the financial system to maintain balance and resilience in the face of various risks and economic disturbances. Bandoi et al., (2009) Provides a definition related to financial stability which is a state of efficient allocation of savings to investment without any significant disturbance effect. It then provides an understanding of financial system stability in general as the ability of the financial system to allocate sources of funds to support economic activity, manage risk, and withstand unexpected changes. Financial stability plays an important role because a stable financial system can help create better economic policies and strengthen long-term economic growth. On the contrary, the instability in the sector financial crisis can trigger a financial crisis and exacerbate economic conditions both macro and micro. Financial Stability also pay attention to the relationship between risk and reward. There are many types of risk associated with the financial system, including market risk, credit risk and liquidity risk. Improving financial stability involves managing risk prudently and avoiding behavior that undermines the trust and credibility of the financial system. There are actually several indicators to measure financial stability in determining the soundness of the financial system, namely by using the Z-Score (Canh et al., 2021).

The threat of cyber attacks as fintech disruption to financial services is a serious problem. Financial services and their technology infrastructure are highly vulnerable to cyber threats. Vučinić & Luburić (2022) said that cyber threat refers to financial failure and loss of reputation due to loss of information due to the fragility of computerized systems or IT systems. Financial system instability can cause disruption and uncertainty in financial markets, and in the end it can trigger a financial crisis that can damage the economy as a whole. Structural factors and the behavior of actors in financial markets can create financial instability (Hardiyanto & Arianti, 2019).

Certainly, the provided text underscores the various negative impacts that can arise as a consequence of financial system instability. Firstly, it highlights the critical aspect of trust. When the financial system becomes unstable, it often leads to a loss of confidence among investors and the public, which can, in turn, reduce the demand for financial assets and exacerbate the crisis. Secondly, it points out that instability can lead to financial losses for investors, as the value of financial assets decreases, and it increases the risk of defaults within the financial sector. Moreover, financial system instability can disrupt credit availability for both companies and consumers, which can hinder economic growth.

Another significant consequence is Capital Adequacy Ratio (CAR), a vital indicator in the banking industry, measures how well a bank can cover the risks it faces. If a bank's CAR value falls below the minimum limit set by regulators, it can signal potentially serious financial difficulties. A low CAR increases a bank's risk of failure, making it difficult for it to meet financial obligations, and triggers regulatory intervention. Supervisory authorities may issue warnings, impose sanctions, or even take over the bank's operations. In addition, difficulties in covered losses may harm the confidence of customers and related parties, trigger withdrawal of funds and worsen the bank's financial condition. Therefore, to maintain CAR above the minimum limit and engage effective risk management are crucial to prevent potential financial distress and maintain the financial stability of the banks.

Many previous domestic and international empirical studies have discussed fintech and financial stability like Didier et al., (2020), FSB (2017) and Noer Ady Rahmanto (2019) collectively suggest that fintech has emerged as a significant economic force, which contributes to the maintenance and even enhancement of financial stability and economic growth. Furthermore, the sentence highlights an additional perspective provided by Pham (2020) reveal that banks capable of generating substantial profits are better positioned to bolster financial stability within the broader economy. In essence, this body of research underscores the vital role of fintech in the realm of financial stability. It reflects a consensus among these studies that fintech is not only a disruptive force but also a positive catalyst in maintaining and fostering economic stability, offering a potential avenue for achieving growth and financial resilience in today's interconnected financial world. This research is supported by Ryoo (2013) which said if the banking sector is more stable then the risk management costs will be lower.

Research from Nguyen & Dang (2022) found that the reduction of fintech's negative effect on financial stability was much stronger for banks with low stability. Furthemore, research from Saraswati & Tisnawati (2021), Vučinić & Luburić (2022) and Gray & Leibrock (2017) shares a common perspective on fintech. They believe that the distribution of large funds by fintech poses a systemic risk that may lead to a reduction in financial stability.

Furthermore, Fung et al., (2020) analyzed the development of fintech on financial stability in developing and developed countries with research objects of 84 banks in Vietnam. The results of their findings, the effect of shocks on fintech innovation policies in developing countries is able to reduce the weaknesses of financial institutions. But in developed countries, the effect of this innovation shock increases the weakness of financial institutions. The study from Fung et al., (2020) does not further explain how the condition of financial stability is a result of the after effects of shocks. Nguyen & Dang (2022) with their research in Vietnam reveals that fintech development in developing markets can reduce the risk of financial stability. Based on several existed empirical studies, we hope that the development of fintech in Indonesia can reduce the risk of financial stability in developing financial markets.

Most of the previous studies have focused more on the impact of fintech on financial inclusion and competition in the financial sector. However, there is a lack of research that pays attention to the impact of fintech on systemic risk and overall financial stability. Then there is the debate about whether tighter regulation of the fintech industry will help minimize systemic risks or hinder innovation. Therefore, more in-depth research is needed to understand how appropriate macroprudential policies can help mitigate systemic risks caused by fintech without hindering innovation in the financial sector.

Therefore, the existence of FinTech in the Indonesian economy can create a destructive impression if banking companies do not always update their technology and the government does not take firm steps in limiting it. Events in the US have made a deep impression on the world over the financial system crises in 1999 and 2000. The financial crisis occurred when the Fed increased interest rates six times in stages and budgeted up to billions of dollars for the sale of shares in technology companies such as Dell, Cisco, and IBM, which made investors liquidate their shares at that time. The liquidation of these stocks by investors caused fluctuations in the economic system.

In 2018, the Bank of England released a report that highlights the potential systemic risks posed by the rapid growth of the fintech industry. The report emphasizes the importance of regulation and supervision to reduce systemic risks that can affect financial stability. Similarly, in China in 2018, there was a notable occurrence in the P2P lending sector. It experienced a bubble, which has led to several P2P lending companies defaulting and ceasing operations. This situation from inadequate regulation and regulatory oversight, resulting in systemic risks within the financial sector.

In accordance with the insights presented by Vučinić & Luburić (2022) in their research, they underline the vital significance of prudently supervised Fintech. Their viewpoint revolves around several key facets of financial technology and its governance. They claim that the application of prudential principles to Fintech supervision is of paramount importance, primarily due to its potential to stave off systemic issues that could ripple through the entire financial sector. By conforming to these regulations, the financial system can effectively mitigate systemic risks, thus upholding its stability. Moreover, they advocate for intensified security measures concerning both data and processes, as well as the creation of secure data spaces to facilitate the development of payment solutions that are not only more affordable but also more reliable and user-friendly. These enhancements, in their view, contribute to sustaining financial stability and operational simplicity within the financial industry.

In this context, it is important to carry out further research and studies on the impact of fintech on financial stability and the role of macroprudential policies in mitigating systemic risks posed by fintech. This research can provide insights and recommendations for regulators and fintech industry players to maintain financial stability and reduce systemic risk in fintech development.

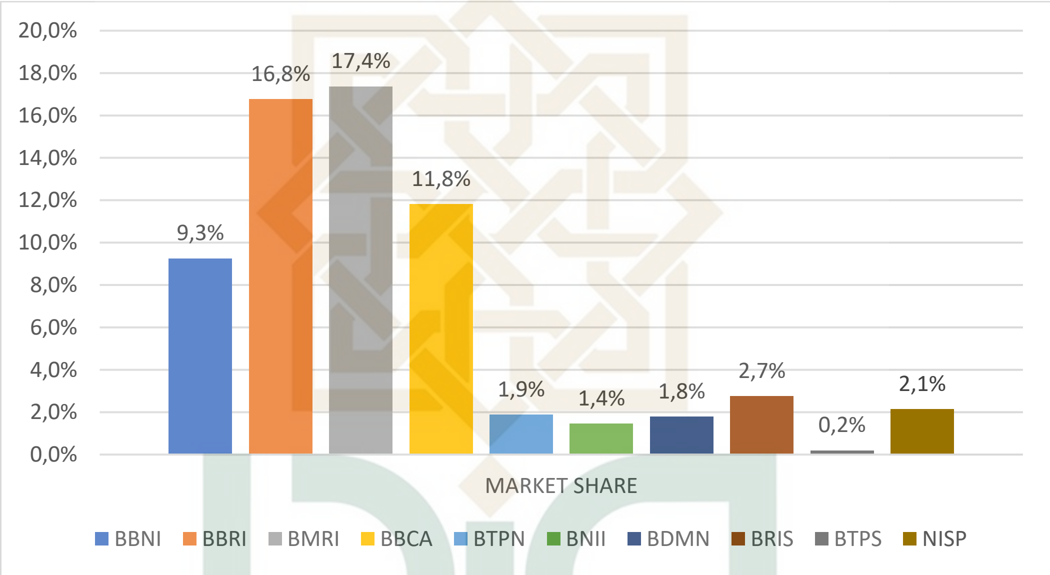
Table 1 Market Capital Banks in Indonesia

No.	Bank	Market Capital
1	BBCA	1.078.656.273.000.000
2	BBRI	754.514.957.000.000
3	BMRI	534.333.123.000.000
4	BBNI	184.248.661.000.000
5	BDMN	26.290.847.000.000
6	BTPN	21.108.135.000.000
7	BNII	19.206.230.000.000
8	BRIS	69.655.243.000.000
9	BTPS	13.095.236.000.000
10	NISP	25.698.721.000.000

Source: indonesia financial services authority, 2023

In this study, we used 10 banks with the market share by total asset is 65.4 percents as the object of research, 2 of them are Islamic banks and 8 others are conventional banks. 65.4 percent is a sufficient number to represent the banking sector.

Figure 2 Market Share by Total Asset



Source : Financial Service Authorities, 2023

Another reason is these banks has a lot of ATM in Indonesia. ATMs that were once traditional financial services are now upgrading their features by adopting payment features, purchases, transfers, cash withdrawals from e-wallets and many other things (Aksari et al, 2022). This makes the transformation of traditional to fintech through e-channeling access. This variable will represent fintech in banking services in Indonesia.

Based on this background description, the researcher is interested in taking the research title **"The Impact of Financial Technology on Financial Stability: The Role of Macroprudential Policy in Mitigating Systemic Risk".**

1.2 Research Question

Based on the description regarding the extraordinary fast growth rate of financial technology, this study intends to examine what impact the growth of financial technology has on financial stability. For this reason, the authors formulate several questions related to this:

1. How is Total Credit Disbursed impact on Financial Stability?
2. How is Macroprudential Liquidity Buffer affects on Financial Stability?
3. How is Capital Adequacy Ratio affects on Financial Stability?
4. How is Total ATM affects to Financial Stability?

1.3 Research Purposes

This study aims to look at the impact of technological financial growth on financial system instability and to look at the systemic risks posed by this growth. Another objective is to see whether macroprudential policies are able to overcome or minimize systemic risks.

1.4 Benefits of Research

1. Benefits for Author

   This research is intended to provide comprehensive knowledge regarding the Impact of Financial Technology on Financial Stability, the Role of Macroprudential Policy in Mitigating Systemic Risk. This research is used as a way to express the author's thoughts which are required to achieve and complete the study of the Bachelor of Islamic Economics.

2. Benefits for Academics

   This study is expected to expand the literature that discusses the themes of financial technology, risk mitigation, financial stability and macroprudential policies at the national level and can become a reference for relevant writing.

3. Benefits for Finance Regulators and Institutions

   This research is of great benefit to financial institution regulators in understanding the impact of FinTech on financial stability and the role of macroprudential policy in addressing systemic risk. This research can provide a basis for better decision-making and more effective actions to minimize risk and maintain financial stability in the future.

1.5 Research Structure

Chapter I Introduction is an important point in the scientific writing process. For this reason, chapter I contains background that describes the phenomenon and initial problems related to the topic of discussion. After describing the background to design a problem formulation that contains research questions. The formulation of this problem is then followed by research objectives and research benefits for various parties. Furthermore, the end of the introduction is the systematic discussion which contains the stages in the research report. Chapter II Theoretical Framework and Hypothesis Development. In this section, the theoretical framework contains previous empirical research that is relevant to the research topic. This previous research is the source of novelty in this research. The framework for thinking is also arranged in this chapter. Chapter III Research Methods explains the description of how the stages of this research are carried out operationally, describes the research variables, research objects, data analysis techniques, research models and test equipment.

In Chapter IV, the author will describe the research results that have been tested using the panel regression method. The data obtained will be presented through various tables, graphs and in-depth analysis. The author will explain the key findings that emerged during this research, and how these results relate to the research questions that have been posed. Through this chapter, the researcher will explore further to understand the implications and significance of the findings in the context of relevant literature. Chapter V is the concluding chapter of the author's thesis, in which the researcher will summarize the results of the research and provide conclusions obtained from this study. The researcher will also discuss the implications of the research results and provide suggestions for further research.

CHAPTER V

CONCLUSION AND SUGGESTION

5.1 Conclusion

Based on the estimation results and comprehensive analysis of the author on the effect of Macroprudential Liquidity Buffer, Total Credit Disbursed and Capital Adequacy Ratio on Z-score in 10 banks in Indonesia. By using the panel regression method and the Random Effect Model approach, the author's conclusions are.

Macroprudential Liquidity Buffer policy has no significant effect on Z-score. This is because the minimum value required by the regulator is too small with the macro and microeconomic conditions that have developed significantly in Indonesia. So it can be said that the Macroprudential Liquidity Buffer policy is not effective in mitigating financial stability risk. The total ATM is not effecting on Z-score also, so it can be conclude that the development fintech through E-channeling and accessibility in not making financial instabillity. Furthermore, Total Credit Disbursed has a positive influence on Z-score. Every increase in credit disbursed by banks can increase the value of financial stability, as evidenced by the statistical value in the REM estimation results. This is apparently due to effective risk management policies at the bank.

A high CAR indicates that the bank has sufficient capital to bear risks, so it is considered an indicator of the bank's financial safety and stability. In this study, there is a positive relationship between high CAR and high Z-Score.

Banks with high CAR tend to have high Z-Score, which indicates that the bank has financial stability and low risk of bankruptcy. It can be said that the development of fintech does not pose credit risk and liquidity risk as long as banks are able to manage risks with effective management.

5.2 Suggestion

For regulators, Bank Indonesia needs to evaluate the minimum liquidity in banks, because the amount of 4 percent is not effective enough to mitigate the threat of risk. Then the evaluation of the value needs to be increased to 5-7 percent. This is because banks need to ensure their liquidity availability when there is an economic crisis problem. Banks need sufficient liquidity to expand, survive from crisis or others.

Then for further research, researchers need to include other macroeconomic variables as a broader picture of how macroeconomic conditions can affect financial stability. Furthermore, researchers need to include effectiveness management variables in future studies. This is to see the perspective of how risk management from the micro level can affect the level of financial stability in Indonesia.

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