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RESEARCH ARTICLE

Covid-19, Diversification and Banking Recovery: Empirical Evidence from Asian Countries

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Abstract: Banks might possibly lower their income fluctuation by expanding their revenue sources beyond typical lending operations into noninterest revenue streams. This study looked at the effect of the COVID-19 pandemic on the connection between Non-interest income, bank profitability and risks. The pandemic's economic effect has resulted in tougher lending rules and decreased demand for different loans. Non-interest income flow is favorably connected with performance but negatively correlated with risk, according to our survey data. These data confirm the well-diversified advantages conveyed by banks from traditional sources of loan revenue throughout the pandemic. The Covid-19 pandemic is used in this research to see if diversification across various dimensions may safeguard European banks from severe negative value shocks. According to our findings, functional diversity has played an essential role in the economy as a shock absorber, and the decrease in the bank stock market has been lowered by 10%. The diversification of the loan portfolio also helps mitigate value shocks, albeit to a lesser degree. Geographical diversity is ineffective as a shock absorber. Banks operating in countries that have reduced systemic risks before the outbreak, greater liquidity buffers, higher cost efficiency, and stronger growth prospects after the outbreak have performed better during the storm.

Keywords: Covid-19; Banks; Profitability; Risk; Non-interest income; Diversification.
JEL Classification Codes: G21, G33

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1 Introduction

Enterprises throughout the world have been severely impacted by the COVID-19 outbreak. While some enterprises were forced out of business, others were able to open their doors as a consequence of this. The bulk of small and medium-sized enterprises and the poor in developing countries are served by microfinance institutions (MFIs), which are their bankers (Cherian, Gaikar, Paul, & Pech, 2021 and Iqbal 2021). Even if the pandemic may present a chance to improve MFIs' social performance, its negative effect on businesses will have a direct influence on MFIs' financial performance. Some financial institutions were able to help their clients with interest rate reductions, while others were able to give other services. The financial crisis in Ghana's banking sector started in 2015, and the advent of Ebola has only exacerbated the situation. Because of what was learnt during the financial crisis of 2007-2009, financial institutions are better prepared for a pandemic (Spash, 2020). Still, pre-pandemic industry data on microfinance institutions (MFIs) might provide valuable insights into the company before and after the financial sector collapse. As the post-COVID-19 era approaches, there have been calls for discussions on how to restart the economy (Mukanjari & Sterner, 2020) and Iqbal (2022).

Diversity pays dividends when the stakes are highest. When a bank is confronted with an unexpected external shock, diversification should function as a buffer. We investigate if the Covid-19 shock has a negative impact on the market value of European banks. The STOXX Europe 600 Banks index dropped 46 percent between February 13 and April 21, 2020, about twice as much as the MSCI Europe Index (minus 24 percent). Market-to-book ratio of euro area banks dropped below the previously unheard-of 0.3 threshold, indicating significant stress in the banking industry (ECB, 2020). Poor values are likely due to a pandemic-induced flood of non-performing loans, low interest rates, and lower bank profitability (Gunay, Can, & Ocak, 2020).

Diversity pays dividends when the stakes are highest. When a bank is confronted with an unexpected external shock, diversification should function as a buffer. We investigate if the Covid-19 shock has a negative impact on the market value of European banks. The STOXX Europe 600 Banks index dropped 46 percent between February 13 and April 21, 2020, about twice as much as the MSCI Europe Index (minus 24 percent). The market-to-book ratio of Euro-area banks dropped to a previously unheard of 0.3, indicating significant stress in the banking system. Poor values are likely due to a pandemic-induced flood of non-performing loans, low interest rates, and lower bank profitability (Gottardi & Scarso, 1994). Investors in the stock market seem to believe that banks would be the worst hurt by the Covid-19 outbreak. Because of this, first quartile average returns for the worst-affected banks are 27 percentage points lower than returns for the least impacted institutions (average of the fourth quartile). Is it possible that this disparity may be accounted for by the fact that we are all unique? A number of governments and banking regulators have regularly urged banks to diversify their activities in terms of function and location (Banna, Hassan, Ahmad, & Alam, 2021). In order to examine whether more diverse banks were better prepared for the shock, the Covid-19 epidemic is employed. It is important to consider three types of diversification in order to capture a broad definition of diversification: geographical (bank branches spread across different countries), functional, and lending counterparty (loans to households vs. non-financial companies (NFCs vs. financial companies) diversification, respectively. European banks with extensive functional variety had a 10% lower decline in market value in the first months of the outbreak than those with a more homogeneous structure. According to Flögel, social, and 2020, geographical diversity has minimal influence on bank stock performance.

Current financial theory emphasises the need of diversifying one's portfolio. Building investment portfolios helps mitigate some of the risks connected with particular assets," according to a finance textbook (Hung, 2021). Investing in a wide range of assets is known as diversification (thus building a portfolio). By diversifying their revenue sources, banks may avoid the dangers of relying only on interest payments (such as service fees, transaction account income, trust activities, etc.). Scholars have researched the effect of diversifying bank revenue streams on profitability and stability for at

least the last 15 to 20 years. Because non-interest revenue accounted for over a third of the net operating income of Bank of America in 2019, the inquiry into this subject is critical. In this research, we look at how bank earnings and risks are linked to non-interest revenue sources in the following scenarios: COVID-19 pandemic-induced economic disaster SARS-CoV-2, the virus that causes COVID-19, was originally discovered in Wuhan, China, on December 31, 2019, and was officially recognised by the World Health Organization on March 11, 2020. It's a global disease (Wang, Law, Hackett, Wang and Chen, 2005). Economically, the disease has had a severe impact. There will be a 14.7 percent unemployment rate in April 2020, when real GDP will have plummeted by 33 percent. There is evidence of the epidemic's influence on the economy in banking. It's important looking at whether banks gain from diversifying their sources of revenue in terms of performance and risk in light of tougher criteria and decreasing demand for most loans. A collection of US banks were studied in this research to investigate whether banks with greater non-interest revenue performed better and were more risky. Our findings reveal that non-interest income has a direct correlation with the company's return on assets and return on equity. Evidence suggests that using non-interest revenue reduces the risk of a company. Non-interest income streams have a good diversification impact while COVID-19 is spreading and influencing the economy in 2020, according to these data. Due to banking financial innovation in the last two to three years, our study conclusions may vary from those of earlier studies. Digital and Internet-based financial services are referred to as "fintech," and they are transforming the banking business in several ways. Despite the fact that fintech may increase the efficiency of conventional banking operations. By 2022, mobile transactions will account for 88 percent of all bank transactions; by 2020, 90 percent of consumers will use mobile phones to make payments. The banking business has definitely been transformed by Fintech, and it will continue to do so in the future (Deci & Ryan, 2010).

Function, geography, and loan exposure are all ways banks might diversify. In the case of a pandemic, we examine whether banks' variety in these three areas may safeguard them from significant losses of value. Existing empirical research on the influence of functional diversity is inconclusive at best. As stated by (Arunachalam and 2020) (Arunachalam and 2020), U.S. banks relying largely on non-interest revenue are more risky but will not yield greater equity returns. Banking institutions with additional services are more stable and lucrative, according to the European Bank. Europe's banks' profitability and franchise value are enhanced through diversification, according to (A. Adeoye, 2007). Functional variety, in our opinion, should operate as a shock absorber in society.

This document's structure follows: Income diversification, profitability, and risk are examined in the second part. Our findings and the hypotheses we examined are summarized in Section 3. Unlike Section 4, Section 5 provides the concluding comments, respectively.

2 Literature Review

Income diversification may seem to be a straightforward notion, resulting in enhanced income stability and decreased threat for banks, mostly if NII is not strongly tied to conventional lending sources of income (Mintz-Woo, Dennig, Liu, & Schinko, 2020). Noninterest income, on the other hand, may be less predictable than typical banking activity for three reasons, resulting in more variable bank profits: Fee-based partnerships are more volatile than typical bank loan arrangements due to reduced information costs and higher rivalry. Expanding into fee-based business lines may involve greater fixed labor expenses, subsequent in enlarged operational control. Since many fee-based income streams are not subject to regulatory capital requirements, banks may have more monetary power and, as a consequence, higher profit volatility if they seek non-interest revenue sources to increase their returns on equity. According to (Khan et al., 2019), greater reliance on noninterest income is associated with higher bank risk and worse risk-adjusted profitability. According to him, one consequence of diversification is that banks may enter areas where they lack knowledge or a competitive advantage. Another technique to explore the consequences of non-interest activities is to look at the stock market. What factors do market participants consider when evaluating a bank's capacity to diversify

its income streams? In order to address this problem, a portfolio technique is utilised to investigate the effect of increased noninterest income on stock market risk and return measures for US bank holding corporations. (Semenda & Semenda, 2018) analyse the relationship between unconventional banking and bank disasters during the financial crisis. They observed that not all sources of non-interest income were equally dangerous. Instead, they observed that, although insurance sales and securities brokerage lower the risk of failure. They also observed that banks who took more risks in unconventional sectors often took greater risks in standard industries. Non-interest income sources, according to research done on US financial institutions, do not give the desired diversification advantages. Noninterest income streams impact bank risk and performance in a more irregular and perhaps more complicated way, according to research on banks outside the United States. They say that these outcomes are due to tiny European banks incoming countries where they lack competence and experience. The research, on the other hand, looks at bank stability in 15 European Union nations and indicates that boosting noninterest income sources makes banks significantly more stable and lucrative. According to, income variety offers considerable benefits (Samani & Alavi, 2020). The event is set on March 11, 2020. The economic implications of the pandemic had a significant impact on the banking industry. According to the Federal Reserve's July survey of senior loan officers, most banks reported tightening credit standards for most loan types, as well as weaker demand for commercial and industrial (C&I), commercial real estate, and consumer loans, though demand for residential mortgages increased slightly (I. A. Adeoye, Onayade, & Fatusi, 2013). Given the higher values and decreased demand for most loans, it's worth analysing whether banks profited by diversifying their sources of revenue in terms of performance and risk. We evaluate a set of US banks in this research to discover whether banks that produce more noninterest income perform better and are riskier. According to our results, noninterest income and performance, as measured by ROA and ROE, are connected. There is also evidence that depending on noninterest income lessens risk (John et al., 2016). These data suggest that employing noninterest income sources had a good diversification impact, at least in early 2020, when COVID-19 was scattering and upsetting the economy. The financial literature has extensively covered varied and targeted income generating approaches. The former is focused with offering a wide variety of products or services, while the latter is concerned with creating interest-bearing loans. In principle, corporations diversify to minimise risk, boost efficiency, acquire market dominance, and for resource exploitation and managerial entrenchment (Estrada, 2021). Diversification, on the other hand, may backfire if the anticipated results are not attained. Furthermore, when managers diversify for their own limited interests rather than the interests of owners, grantors, or the pro-poor customers they must serve, they risk creating an agency problem. According to numerous researchers, diversification diminishes value by diluting existing management skills and raising agency costs. In the banking business, where the link between diversity and performance has been widely researched, such research abounds (Fraser, Aldrich, & Page-Tan, 2021).

Banks may diversify in three ways: operationally, geographically, and in terms of loan exposures. We study whether, in the case of a pandemic, variety in these three dimensions may safeguard banks from large value losses (Estrada, 2021). The research on the influence of functional variety is conflicting. Banks in the United States that depend substantially on non-interest earnings, according to the report, are riskier, but their equity returns aren't better. (Song & Zhou, 2020) revealed that greater non-interest income banks in the United States were more lucrative, but not riskier. Banks with more functional variety are more stable and lucrative in Europe. Diversification boosts the profitability and franchise value of European banks, according to studies (Ghaemi Asl & Rashidi, 2021 and Nadeem et al 2022). As a consequence of these results, we suggest that functional diversity should act as a shock absorber. According to the researchers, geographic complexity boosts the ability to absorb local shocks while decreasing susceptibility to global shocks for a global sample. One research found that bank performance is adversely linked to geographic diversity (Chakrabarty, Electronics, & 2020, 2020). Better geographical dispersion is related with reduced default risk and greater profitability for European banks, but also with higher profit volatility. Furthermore, during times of sovereign crisis, these impacts are accentuated. As a consequence, given the pandemic's worldwide spread and

variable impacts across locations, it's unknown how regional diversification will play out throughout the Covid-19 era. Loan portfolio diversification, according to the report, did not benefit Italian banks. Diversification, on the other hand, assists Austrian banks in lowering realised risk. Mukanjari and Sterner (2020) established a link between loan portfolio variety and bank stability in the United States. The bulk of these papers are concerned on industry diversity rather than the wider lending counterparty categories under consideration. A substantial number of articles have focused on the mitigating influence of capital when analysing bank performance during the Great Recession. Banks in industrialised nations with greater capital ratios enjoy better stock returns, according to. Domestic banks with less liquidity and global banks with more leverage were more likely to collapse in a sample of European and American institutions. Revenue diversification was connected to higher profitability and decreased risk for US banks during the Covid-19 outbreak. Banks with less liquidity, on the other hand, underperformed throughout the outbreak (in a global sample). The necessity for liquidity among US institutions has been established (Fernando, Fitrianingrum, & Richardson, 2017 and Iqbal et al. 2021). As a consequence, capital and liquidity ratios must be taken into account.

3 Data Methodology

In this research, we investigate the relation between net noninterest income (NNII) and bank profitability or bank risk by estimating the following equations:

$$ROAi,t = \beta 1 Equityi,t + \beta 2 Expensei,t + \beta 3 Sizei,t + \beta 4 Bondsi,t + \beta 5 Diversificationi,t + \beta 6 Provisionsi,t + \beta 7 GDPt + \varepsilon i,t \quad (1)$$

$$NIMi,t = \beta 1 Equityi,t + \beta 2 Expensei,t + \beta 3 Sizei,t + \beta 4 Bondsi,t + \beta 5 Diversificationi,t + \beta 6 Provisionsi,t + \beta 7 GDPt + \varepsilon i,t \quad (2)$$

Where, i refers to banks (i = 1, . . . , 13) and t refers to time period (t = 1, . . . , T = (2010-2020).

The definitions of the two dependent variables are as follows:

ROA = Profit before taxes divided by total assets (return on assets).

NIM = Net interest margin = [(Interest income – Interest expense) / Total assets].

The definitions of the seven independent variables are as follows:

Equity = Equity capital to total assets.

Expense = Operating expenses / (interest income – interest expense).

Size = Natural logarithm of total assets.

Bonds = Investment in government securities to total credit.

Diversification = Net commission income / (interest income – interest expense).

Provisions = Loan loss provisions to total credit. GDP = Real GDP growth rate.

Covid-19 is defined as the period between the STOXX Europe 600 Banks' highest and lowest points in the first half of 2020, i.e. February 13 and April 21, 2020. Between these periods, I estimated the stock market return for bank I. The returns are regressed using three pre-Covid diversification measures (DIVj,i) and K control variables.

There are a number of other control factors that we believe impact bank stock returns. Differences in systemic risk may be accounted for by the market's beta. During economic downturns, banks with a larger beta are predicted to be impacted more severely. A CAPM model is used to calculate pre-Covid betas. We utilise a weighted average of national or regional MSCI index returns, depending on the bank's branch dispersion, to account for disparities in banks' geographic reach. Second, we'll have a capital ratio by the end of 2019. Banks with larger capital ratios should be better equipped to

withstand an external shock since capital acts as a buffer. At the beginning of this crisis, we employ the LCR and its many components to account for variations in liquidity levels (high quality liquid assets and net cash outflows). Logarithm of total assets, return on equity, cost to income and market to book are added to diverse factors to account for pre-Covid discrepancies in size, performance and profitability (all end-2019). Based on EBA data on banks' exposure to non-performing loans in 19 different sectors, we created a CovidHigh measure to account for the risk of future non-performing loans as a consequence of the Covid-19 pandemic. In the four sectors most affected by the pandemic, this variable measures loans to non-financial businesses (as a percentage of total assets). Using MSCI sectoral indices from February 13 to April 21, 2020, we'll be able to identify these sectors. In order to account for cross-country differences in the pandemic's effect, we add a dummy for banks located in one of the five most-affected countries (Belgium, Iceland, Ireland, Italy, and Spain; based on the number of Covid-19 cases on April 21, 2020). Our GDP growth estimates are another option. Because all bank variables are based on pre-Covid data, it is possible to determine the influence of an external shock on bank values. Due to the fact that the banks in our sample did not publish their Q1 results until April 21, 2020, the market's appraisal of the level of pandemic-related loan loss provisions, higher- or lower-than-expected Q1 earnings, and so on had no impact on the returns.

Definitions of the variables utilized in this investigation are summarized in Table 1. To illustrate how noninterest impacts bank profitability and risk, we compute Equations (1) and (2). The following are the null hypotheses that we are primarily looking into:

In the COVID-19 outbreak, as assessed by ROA and ROE, noninterest income had minimal impact on bank profitability (ROE). The standard deviations of ROA and ROE reveal that noninterest income has no effect on bank risk during the COVID-19 epidemic. DeYoung and Roland's results are in accordance with previous empirical studies on U.S. banks that showed little indication of a diversification impact from the usage of NII streams (2001).

4 Data Analysis and Results

The data was analyzed using descriptive and inferential statistics, which are shown in the tables below. Tables 4 and 5 show the cross-sectional regression estimates. Data show that a certain kind of diversification functions as a substantial bank value shock absorber. Usually positive and highly significant, the coefficient of functional variety shows that investors prefer non-interest income. ECB unconventional monetary policy flattening the yield curve for a longer period than projected will hurt bank interest profits significantly more than expected. Because of this, banks that do not pay interest should be able to outperform their retail counterparts in terms of profits. HHI-based functional diversity (specification 1) may be replaced with the percentage of non-interest revenue in operational income (specification 2), and the results are same. These findings support the theory that functional variety improves the performance of European banks. The results of US banks throughout the pandemic are also consistent with this conclusion. When faced with a negative exogenous shock, geographic diversity cannot protect bank pricing. Unfavorable stock return protection doesn't exist when you're operating in many nations or regions. Using the number of countries the bank operates as a replacement for the HHI-based variable results in the same conclusion (specification 3). It's possible that market investors assumed that the pandemic's effect would be the same across areas, preventing these institutions from benefiting from risk reduction via less-than-perfect correlations between country-specific threats. The coefficient is positive and important when it comes to lending counterparty diversity.

Table 1: Descriptive Statistics

	ROA	NNII	Deposits	Loans	LR	LLP	Size	GDP	Inf
Mean	0.701	23.367	38.978	15.867	7.023	-4.334	3.312	3.622	9.111
Median	0.768	26.345	39.389	14.812	3.878	-2.165	3.511	3.911	8.644
Maximum	0.109	185.277	93.498	43.923	144.7324	2.234	4.311	5.833	20.556
Minimum	0.000	-198.207	0.145	1.0234	-1.998	-49.455	0.255	0.955	2.566
Std. Dev.	0.245	28.779	15.236	5.834	12.675	7.456	0.866	1.666	4.977
Skewness	-1.456	-0.113	-0.445	1.856	6.478	-3.478	-1.388	-0.267	0.666
Kurtosis	5.345	22.674	3.534	9.612	56.894	15.123	4.455	1.678	2.888
Jarque-Bera	262.783	6679.425	15.677	1023.243	53312.24	3634.213	167.661	35.780	30.888
Probability	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Obs.	500	500	500	500	500	500	500	500	500

Note: This table shows the summary details of all study variables.

The above table shows the summary statistics of the study variables like mean median, maximum, minimum, SD, p value and number of observations are presented in the above table.

Table 2: Correlation Coefficients

	ROA	NNII	Deposits	Loans	LR	LLP	Size	GDP	Inf
ROA	1								
NNII	0.064**	1							
Deposits	0.456**	0.245	1						
Loans	-0.245**	-0.221*	0.212	1					
LR	-0.178**	-0.336	-0.344*	-0.065	1				
LLP	-0.456**	0.354*	0.587	0.145	-0.231	1			
Size	0.821**	0.156	0.322*	-0.349	-0.672*	-0.712*	1		
GDP	0.056**	-0.785	0.033	0.034*	-0.783	-0.043	-0.012*	1	
Inf	-0.346**	0.023	-0.441	-0.232	0.054	0.034	-0.134	-0.81	1

Note: This table showed the correlation coefficient values of the study variables,
** Correlation is significant at the level 0.01, * correlation is significant at the 0.05 level.

Table 3 shows the outcomes of quantile regression in case of concerned study variables. Firstly the OLS has been done after that the comparison has been made with the different percentage of quantile regression.

Our findings are shown in tables 2 and 3. Starting with a univariate research, we compare the ROA and ROE of banks with different levels of noninterest income and risk (SDROA and SDROE). Table 3 shows the NNII quintiles' performance and risk measures. It can be shown from Table 3 that when noninterest income grows in Table 3, the ROA and ROE performance increases, but the risk lowers as assessed by ROA and ROE standard deviation. 2.2 percent (4.0 percent) is the median ROA for the top quintile, whereas 0.1 percent is the median ROA (ROE) for the bottom quintile (0.9 percent). There are considerable differences in ROA and ROE averages from zero at the one-percent level. Mean standard deviation of ROA in the top quintile is 0.4% (0.9%), but mean standard deviation of ROA in the lowest quintile is 1.7%. In terms of risk measurements' meanings, the one-percent disparity is the same. Noninterest-earning banks are more lucrative and less dangerous, according to these findings.

Table 3: Results of Quantile Regression

Model	OLS	Q.25	Q.50	Q.75	Q.95
DV	ROA	ROA	ROA	ROA	ROA
NNII	0.011***	-0.341***	0.022***	0.012**	0.331
Deposits	0.016***	0.136***	0.016***	0.223***	0.115
Loans	-0.235***	0.118***	0.238***	-0.566***	-6.38E-06
LR	-0.127***	-0348***	-0.097***	-0.065	-0.064
LLP	-0.116***	0.016***	-0.030***	0.05	-0.032
Size	0.017	0.078**	0.043**	0.011	0.217
GDP	0.117**	0.016	-0.034*	0.024	0.056*
Inf	-0.053*	0.042	-0.082	-0.091**	-0.053
Constant	0.411	0.234	0.334	0.677	1.987
R sq	0.43	0.444	0.321	0.657	0.234
P value	0	0	0	0	0

Note: This table reports the results of the Quantile regression.

However, multivariate testing should be considered since there are so many variables that might affect a bank's performance and risk. Results from the estimate of Equations (1) and (2) are shown in Table 4. (2). (2). The computed coefficients for NNII are positive and statistically significant for bank profitability metrics. Banking profits are enhanced by using noninterest sources of income. NNII coefficients for bank risk indicators are negative and statistically significant at the 1% level, which indicates that the COVID-19 has distinct features.

The mean and standard error for each quintile are provided in parentheses under the mean. There are 43 banks in each of the other quintiles, except for the highest one, which has 44. The symbols ***, **, and * signify statistical significance at the 1%, 5%, and 10% levels, respectively. Fintech's effect on the banking sector may also be shown by these findings. Lagged factors have better and statistically significant outcomes when compared to control variables. Asset growth (TA) statistics show that banks with high asset growth are more profitable and less risky.

Data show that income diversity had a negative and statistically significant impact on profitability at 1% significance levels, except in models that included an interaction between income diversification and size. This shows that microfinance organisations' profitability is negatively impacted by revenue diversification. In other words, having a larger revenue model that aims to earn money from a variety of sources has a negative impact on MFI performance in Ghana. Income diversification may have a negative impact on MFIs' earnings, meaning that MFIs should concentrate on their conventional revenue-generating operations (i.e. interest-bearing loans) rather than aiming to expand into non-interest income sources (i.e. an even wider variety of financial products). According to (Algamdi, Brika, Musa & Chergui, 2021), who studied universal banks and found this to be the case. According to one research, diversification has a negative influence on MFI profitability, whereas diversification has a good impact on profitability (Banna et al., 2021; Khan et al. 2022 and Lu et al 2021). The findings show that microfinance institutions need a clear plan for increasing their sources of revenue. When it comes to income diversification, the quadratic term has a large negative influence, which means that as MFIs diversify more, the profitability drain will get more severe.

A wide range of factors, including the size of the institution and the tangibility and liquidity of its assets, affect the profitability of MFIs. Size has a considerable impact on asset and equity returns, according to the statistics. This suggests that economies of scale may be possible for bigger enterprises due to the likelihood of greater earnings. In order to further investigate this link, the model includes the size square, and the findings show a negative and substantial nexus. MFIs demonstrate an inverted U-shape link between profitability and size; nevertheless, extremely big MFIs have a negative impact on profits. Additionally, asset tangibility has a substantial influence on profitability, which means that MFIs with large fixed assets are more profitable. That's because they can develop grassroots structures that allow them to interact with clients, allowing them to generate more money than businesses with less resources. It is possible to increase profits even when income diversification and asset tangibility interact. MFIs will continue to invest in physical assets to maximise value despite the rise of intangibles in the service business.

According to the statistics, liquidity has a negative and significant impact on both ROA and ROE, but not by a large margin. A bank's profitability is affected when the deposit to lending ratio is raised. Given that deposits are around 11 times more valuable than loans, this begs the issue of how these MFIs are spending their money rather than lending it out. On hand funds and government securities account for more than half of the assets of the institutions studied. Because deposits are not processed as loans, financial intermediation suffers, a practise that may help reduce poverty. In order to increase profitability, MFIs in Ghana need to concentrate more on lending to the general people, according to this report. Income diversification does not seem to be directly linked to profitability.

5 Conclusion

In this paper, we analyse the relationship between bank profit and risk by looking at the economic crisis caused by the COVID-19 epidemic as a case study. We also look at the use of noninterest revenue sources. These findings imply that the usage of noninterest income sources had a positive effect on diversification during the time when COVID-19 developed fast and had a significant economic impact. Finally, considering the explosion of financial innovation during the preceding two to three decades, additional research is needed to determine how fintech adoption impacts the financial performance of financial institutions (banks).

Functional diversity, in addition to being statistically significant, turns out to be the most economically significant component of diversification. The difference between the average value of the interest variable in the first and fourth quartiles is calculated and multiplied by the regression coefficient of the interest variable to get the interest variable's standard deviation. In this section, we estimate the difference in return between banks with low (first quartile) and high (fourth quartile) values for this variable in terms of returns. The difference in return between banks with high levels of functional diversity and banks with low levels of functional diversity is around 8.9 percent. The difference between condition 2 and the proportion of non-interest income is much bigger, accounting for 10.2 percentage points of the difference. The gap between high and low lending counterparty diversity in terms of lending counterparty diversity is around 4.4 percentage points in lending counterparty diversity. When controlling for control factors, the beta is very negative, indicating that banks with a high level of pre-pandemic systematic risk incurred the most severe value loss. This is consistent with the results of the Covid-19 epidemic among non-financial organizations, which was reported earlier this year. To many people's surprise, the equity-to-assets ratio is not very significant. This outcome seems to be in direct opposition to those who believe that capital enhances performance.

In accordance with the findings of the study, MFI earnings are tiny, and their diversification strategies are often below average. According to our results, income diversification has a detrimental influence on the return on assets and return on equity of microfinance institutions. Furthermore, when income diversification is doubled by two, it has a statistically significant negative impact on profit margins. In general, bigger microfinance organisations generate more money, but the connection is inverted U-shaped, showing that point size may be a disincentive to good performance. Moreover,

it was said that institutions with more physical assets earn more money, meaning that resources are required to build up the MFI framework. Businesses with a wide range of assets and a high concentration of fixed assets are more likely to be profitable than others. The vast majority of MFI assets are kept in cash and government securities, with deposits surpassing 11 times the amount of loans and advances, raising concerns about the degree to which financial intermediation is taking place in the country. Poor-performing microfinance institutions (MFIs) are those that do not provide loans after receiving deposits.

According to the research, managers are losing money by keeping huge quantities of deposits or assets such as cash and currency equivalents on their balance sheets for long periods of time. It is impossible to overstate the importance of promoting financial intermediation, and it is self-evident that hoarding money as a result of credit risk and large non-performing loans is adverse to the value growth of the company and the economy. A more concentrated approach should be taken by managers, who should aim to specialise in a particular product and become the best or most efficient at it, rather than adopting a "jack of all trades" strategy, which is both more costly and less lucrative. Emphasizing the importance of tangibles is crucial because customers, who are mostly impoverished, would lose faith in their institutions if they do not have a visible presence in their communities. It is important to recognise the importance of intangible capital, and management strategies should search for ways to develop value from intangible assets as well. Overall, corporate executives should aim to improve their organisations via the use of big data analysis, and every company should attempt to produce data internally from client interactions. Organizations should engage in this activity as part of their overall strategy in the present business environment, in which data science has acquired relevance.

5.1 Policy Implications

The research has policy implications, given the Bank of Ghana's recent focus on fostering consumer confidence and enhancing the regulatory environment, according to the authors. A major focus of post-COVID-19 monitoring activities should be on diversification tactics and persuading institutions to make loans as part of their financial intermediation operations, given that the pandemic has irreversibly changed MFIs' position. Some grantors of microfinance institutions (MFIs) should pay special attention to whether the institutions are reaching out to the pro-poor community that they are supposed to serve. Other issues that need to be addressed in policy talks include the difficulty of risk management, corporate governance concerns, and the possibility of a pandemic resurrecting itself. It is recommended that future study investigate the function of corporate governance systems as a mediating factor and that the present results be replicated in other developing markets. Second, research should try to examine the factors that influence the economic efficiency of microfinance institutions (MFIs) using well-established approaches such as data envelopment analysis and stochastic frontier analysis. There should be a re-evaluation of the effect of COVID-19 on the microfinance industry as well as the whole financial system in developing nations.

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