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Analyzing the Impact of Financial Liberalization on Malaysian Bank's Performance: Quantile Regression Analysis

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Abstract: This study employs quantile regression analysis to examine the impact of financial liberalization on the performance of Malaysian banks, focusing on how these effects vary across different performance levels. A liberalized banking sector prompted commercial banks to intensify risk-taking activities, which ultimately could affect the bank's performance. Using quantile regression analysis, it shows that only the middle quantile indicates all the significant variables for both OLS and quantile analysis. This study found that lower-performing banks may face adverse effects, including increased risk and deteriorating performance, due to heightened financial liberalization. The findings highlight the differential impact of financial liberalization across the performance spectrum and suggest that while liberalization can drive economic growth targeted regulatory measures are necessary to support less and mitigate potential risks to overall financial stability in Malaysia.

Keywords: *Financial Liberalisation, bank performance, quantile.*

1. Introduction and Background

A strong financial system is essential for bank performance and financial stability, which influence investor confidence, economic growth, and overall economic stability. Banks can run effectively and profitably when the financial system is stable. Banks serve as financial intermediaries that facilitate the implementation of monetary policy within the financial system to ensure financial stability. However, the shift from financial repression to financial liberalization, which encourages the movement of capital across borders and the expansion of the financial sector, has led to substantial transformations in the global financial system. Hence, the transition from financial repression to financial liberalization, characterized by the deregulation and reform of the domestic financial sector, will inevitably impact the stability of the financial system. Hence, preserving financial stability requires a thorough understanding of bank performance.

The seminal works of Shaw (1973) and McKinnon (1973) gave rise to the financial liberalization theory. These academics contend that financial repression will hinder financial sector development. Consequently, they recommend financial liberalization policies will boost investment and savings as well as economic growth. According to Hamdi and Jlassi (2014), financial liberalization is the process of putting in place several policies aimed at getting rid of the different controls and limitations that a nation has placed on its financial sector to promote economic growth. Reforming the financial system and financial liberalization are related. Unite and Sullivan (2003) state that the reforms take the form of lowering barriers that allow foreign banks to enter the domestic market and relaxing or eliminating restrictions on foreign investment. Deregulation, which permits foreign-controlled banks to operate in the country, and regulation, which provides incentives for foreign ownership of a portion of domestic banks, are two possible forms of this reform. To facilitate the process of financial liberalization for an integrated global financial market, the government drives and supports it through policy reform.

The Central Bank of Malaysia formerly known as Bank Negara Malaysia (BNM), declared the commencement of its financial liberalization in the year 2009. The announcement of liberalization measures intends to improve Malaysia's economic ties with other nations and highlight the financial sector's crucial role as a catalyst and facilitator of economic progress. The goals outlined in the Financial Sector Master Plan (FSMP)in the year 2001, to create a strong, diverse, and effective financial sector are aligned with these liberalization initiatives. The primary goal of further liberalization is to create a more robust, diverse, and effective financial industry. Furthermore, the goal of financial liberalization is to make domestic and international financial institutions more competitive to maintain overall financial stability and soundness. The most recent stage of financial

liberalization has been centered on improving the resilience and efficiency of the system. The Financial Sector Blueprint 2022-2026 of Bank Negara Malaysia (BNM) remains committed to enhancing financial inclusion and strengthening digital and innovative financial services to meet the dynamic demands of the market. Overall, Malaysia has changed its approach to financial liberalization from initial market liberalization and deregulation to a more balanced approach that takes sustainability, innovation, and stability into account. The country continues to adapt its financial policies to adhere to global standards and address emerging challenges.

Shehzad and Haan (2008) and Daniel and Jones (2007) contend that financial liberalization and financial stability are related and that one will cause the other. Gruben, Koo and Moore (2003) provide more evidence in favor of this theory, concluding that the likelihood of bank collapse increases under liberalized regimes. Hence, financial liberalization would support financial development and boost economic progress even if it is associated with financial instability (Ranciere, Tornell, and Westermann, 2006). Therefore, the research gap is unified by an understanding of how financial liberalization affects banks at various performance levels is made possible by quantile analysis. This approach looks at the effects at different places in the distribution of bank performance indicators, such as return on assets (ROA), rather than just concentrating on average effects (Koenker & Hallock, 2001).

Quantile regression studies by Nguyen, Skully, & Perera (2021) have demonstrated that there may be substantial variation in the impact of financial liberalization on return on assets (ROA) between quantiles. The impacts of financial liberalization on bank performance have been the subject of a recent study (Shen, Chen, & Chen, 2020). These findings imply that while financial liberalization can raise efficiency and profitability, it can also increase risk-taking. Quantile analysis has emerged as a valuable tool in this context, allowing researchers to examine how liberalization affects banks across different levels of performance and risk. Using quantile regression analysis, Claessens and van Horen (2014) explore how financial liberalization impacts bank performance and find that this effect varies significantly across different quantiles of the bank performance distribution.

Therefore, this research intends to add to the growing body of knowledge on financial growth and economic policy by offering empirical data on the connection between financial liberalization and bank performance in Malaysia. It aims to provide insights into the diverse consequences of liberalization policies by concentrating on the quantile effects. These insights can then be used to generate more focused regulatory and policy actions that promote the banking sector's sustainable growth. Therefore, the rest of the work is divided into subsequent sections: the second section examines the existing literature; the third section provides a comprehensive explanation of the data and methodology, and the fourth section discusses the conclusions and analysis. The study's implications are discussed in the fifth and concluding section.

2. Literature Review

Research has demonstrated that financial liberalization may have both beneficial and bad consequences on bank performance. According to Levine et al. (2000), there is a possibility that it will improve bank efficiency and competitiveness through the removal of regulatory barriers to innovation. Yet, if robust regulatory frameworks aren't in place, it can encourage risk-taking and financial instability (Demirgüç-Kunt & Detragiache, 1998). For instance, if regulatory supervision is insufficient, liberalization may cause crises in emerging economies even if it can also increase efficiency (Rajan & Zingales, 2003). According to Hellmann et al. (2000), the regulatory environment's resilience has a critical impact on the overall impact of financial liberalization on bank performance.

Recent research has also explored the impact of financial liberalization on bank performance, offering insights from both Malaysian and global perspectives. Rathnayake et al. (2022) conducted a study on interest rate liberalization and commercial bank performance in Chinese A-Share banks, utilizing a Generalized Method of Moments (GMM) framework. The results indicated that interest rate liberalization and the removal of specific entry barriers enhanced competition and efficiency in the banking sector, leading to reduced bank interest margins. In a study focusing on Malaysian commercial banks, Ma & Soh (2021) examined the impact of liberalization on the determinants of bank efficiency. The research highlighted financial liberalization as a beneficial factor that stimulates the development of the financial sector by eliminating repressive policies,

thereby fostering efficiency and market liquidity. This study underscores the positive effects of liberalization on enhancing the operational efficiency and competitiveness of banks in Malaysia. Financial liberalization can improve asset quality and liquidity by promoting better risk management practices and access to diversified funding sources. This aligns with findings from (Farhat, 2023), who emphasizes that financial liberalization is a crucial determinant of banking sector development in emerging economies. 's study indicates a significant correlation between banking sector growth and financial liberalization, suggesting that liberalization facilitates better access to capital and promotes competitive practices among banks, ultimately leading to improved financial performance. Moreover, the entry of foreign banks, as noted, introduces advanced management practices and technology, further stimulating the development of the Malaysian banking sector.

Financial liberalization has significantly impacted the performance and stability of banks in Malaysia. Abdullah et al. (2004), for example, look at how financial liberalization affected the Malaysian banking industry and discover that although it increased competitiveness and efficiency, it also brought new risks and vulnerabilities, which were especially noticeable during the 1997–1998 Asian financial crisis. To reduce those risks, the study highlights the necessity of efficient regulatory structures. The study conducted by Elryah (2014) offers empirical data about the effects of liberalization and reforms on the performance of Islamic banks in Malaysia. The study employed a panel regression model to examine the relationship between Islamic banks' performance and financial liberalization and reforms. The Z-score was utilized to quantify the association between the banks' equity and return on assets. The results show that profitability, return on assets, financial liberalization and openness, and inflation all statistically positively affect the performance of Islamic banks.

Andries and Capraru (2011) examine how financial liberalization affected the performance of 236 banks from 17 countries in Central and Eastern Europe between 2004 and 2008. Their findings demonstrate that nations with higher degrees of liberalization and openness may boost their economies and provide their customers with more affordable services. Additionally, the degree of bank reform, the soundness score, bank safety, and the interest rate liberalization indicator all positively affect banks' productivity development. Andri et al. (2012), Examined the effects of the banking reform on the financial performance of five Central and Eastern European nations between 2001 and 2008. The evidence shows that the bank performance index, which is based on the cost of intermediation, operational performance, and return on assets, is positively impacted by the financial and banking reform indices. Recent empirical evidence, Nguyen, Skully, and Perera (2021), Kim, Lin, and Suardi (2022), and Shen, Chen, and Chen (2020), among others, supports the results by demonstrating the intricate interactions between financial liberalization, bank performance, and risk-taking behaviors. Their findings suggest that while liberalization can drive efficiency, it also necessitates stringent regulatory oversight to mitigate associated risks (Arestis & Phelps, 2019). This is echoed by Moyo & Roux (2020), who conducted a study revealing that although financial liberalization can lead to improved efficiency, it simultaneously increases the potential for financial instability without adequate regulatory frameworks.

A meta-analysis of the effects of financial liberalization on bank risk-taking is presented by Shen et al. (2020), who contend that although liberalization can increase efficiency, it also calls for strict regulatory monitoring to control the risks involved. Using a quantile regression technique, Nguyen et al. (2021) show that middle quantile banks in Asia—including Malaysia—benefit most from liberalization in terms of return on assets (ROA). Further elaborating on these findings, Kim et al. (2022) demonstrate that the sequencing and timing of liberalization measures have a significant impact on their results. Kim et al. (2022) further elaborate on these findings, showing that the timing and sequence of liberalization measures critically affect their outcomes, with phased liberalization proving more beneficial for bank performance. Their research indicates that a phased approach to liberalization tends to yield more favorable outcomes for bank performance, suggesting that the order and timing of reforms are critical in determining their effectiveness (Wang & Luo, 2023). This aligns with the broader literature on financial liberalization, which posits that the regulatory environment significantly influences the outcomes of such reforms (Moyo & Roux, 2020). Additionally, Moyo & Roux (2020) argue that the interaction between financial liberalization and regulatory quality is crucial, noting that stronger regulatory frameworks can mitigate the risks associated with liberalization, thereby reducing the likelihood of financial crises. Similarly, Wang & Luo (2023) highlight that while financial liberalization can stimulate growth, it also poses risks that need to be managed effectively to ensure banking stability.

The relationship between asset quality and bank performance is well-documented in the literature, highlighting the critical role that asset quality plays in determining profitability and stability. Roman and Danuletiu (2013) demonstrate that banking liquidity, asset quality, and management quality are the primary determinants of banks' profitability and stability, while economic growth rate and banking concentration are the external factors that have the greatest impact on banks' profitability. High asset quality typically leads to lower provisioning for bad debts, higher profitability, and enhanced bank stability. Poor asset quality, on the other hand, increases the risk of defaults, requiring higher provisions and reducing profitability. Studies from both Malaysian and global perspectives have shed light on the impact of asset quality on bank performance (Aldizar & Agustina, 2022). Aldizar & Agustina, 2022) found that asset quality has a significant negative effect on profitability, emphasizing the importance of maintaining high asset quality levels for improved financial performance. Similarly, Samail et al. (2018) highlighted a significant relationship between asset quality and liquidity management in influencing the performance of Islamic banking in Malaysia, underscoring the critical role of asset quality in shaping bank performance that can be measured using a bank's profitability.

Further literature reinforces these findings by exploring the broader implications of asset quality on banking performance. Muriithi & Waweru (2017) examined liquidity risk and its impact on financial performance, revealing that effective liquidity management is closely tied to asset quality, which ultimately influences profitability. Additionally, Gharaibeh et al. (2022) discussed how various risks, including asset quality, affect the stability of banks, suggesting that maintaining high asset quality is vital for enhancing bank stability and profitability. Moreover, the CAMEL framework, which includes asset quality as a key component, has been widely used to assess bank performance and stability, indicating that banks with higher asset quality tend to exhibit better financial health and resilience against economic shocks (Kočenda and Iwasaki, 2021). These studies collectively underscore the importance of asset quality in shaping the financial performance and stability of banks, reinforcing the need for effective asset management strategies to mitigate risks and enhance profitability.

To explore the impact of liquidity on bank performance, various studies have provided valuable insights from both Malaysian and global perspectives. A study by Arif & Anees (2012) found that liquidity risk significantly affects bank profitability, with factors such as liquidity gap and non-performing loans exacerbating this risk. Similarly, Yahaya et al. (2022) revealed a significant negative association between liquidity risk and bank performance, highlighting the importance of effective liquidity management for improved financial performance. These findings emphasize the critical role of liquidity management in influencing bank performance. Sufficient liquidity ensures that a bank can cover withdrawals from customers and reduce the risk of a bank run. However, holding too much liquidity can reduce profitability since liquid assets often yield lower returns. Conversely, insufficient liquidity can lead to solvency issues and higher funding costs. Recent studies further elaborate on these themes, highlighting the nuanced relationship between liquidity and profitability. Ahmad (2023) discusses how banks with lower liquidity thresholds rely on profitability to enhance their stability and attract deposits, thereby improving liquidity and reducing exposure to liquidity risk. In a broader context, Mohammad (2024) examines the relationship between liquid asset holdings and profitability in South Asia, indicating that banks with higher liquid assets may engage in riskier behaviors, which can impact their overall performance. Additionally, Ben-Ahmed (2023) explores the interplay between credit and liquidity risks, revealing that increased liquidity risk negatively affects bank profitability, particularly in the context of Tunisian banks. These findings collectively underscore the critical importance of liquidity management in shaping bank performance, as banks must navigate the delicate balance between maintaining sufficient liquidity and optimizing profitability.

Studies also have extensively explored the relationship between capital adequacy and bank performance from both Malaysian and global perspectives. For instance, Odekina (2019) highlighted that capital adequacy significantly stimulates and enhances the financial performance of commercial banks, underscoring the importance of sufficient capital and effective management in driving improved performance. Strong capital adequacy improves a bank's ability to absorb losses reduces the likelihood of insolvency and enhances overall stability. However, maintaining high capital ratios can also limit the return on equity (ROE) by reducing leverage. This assertion is supported by findings from Amissah & Opoku (2023), who reported an inverse relationship between the capital-to-asset ratio (CAR) and return on equity (ROE) among selected banks in Ghana, indicating that higher capital levels may limit profitability due to reduced leverage. Similarly, Balami &

Chalise (2023) found that while capital adequacy is essential for financial stability, its impact on profitability can be complex, suggesting that excessive capital may hinder banks' ability to optimize returns on equity. These studies collectively highlight the dual role of capital adequacy in promoting stability while potentially constraining profitability.

Further research has expanded on these themes, illustrating the nuanced dynamics between capital adequacy and bank performance across different contexts. For instance, Setiawan & Muchtar (2021) demonstrated a positive relationship between return on equity and capital adequacy in Indonesian banks, suggesting that profitable banks tend to maintain higher capital levels. In contrast, Sah & Saud (2022) found a significant negative association between capital adequacy and ROE in Nepalese commercial banks, indicating that while capital is crucial for stability, it may also impose constraints on profitability. Additionally, Harkati et al. (2020) explored the differential impacts of capital adequacy on risk-taking behavior in conventional and Islamic banks in Malaysia, revealing that adequate capital can mitigate risk-taking tendencies, thereby enhancing overall financial performance. This body of literature underscores the importance of capital adequacy as a determinant of bank performance, highlighting the need for banks to strike a balance between maintaining sufficient capital for stability and optimizing returns for shareholders

The relationship between non-performing loans (NPLs) and bank profitability remains a critical area of inquiry in the banking literature. Athanasoglou, Brissimis, and Delis (2008) and Dietrich and Wanzenried (2011) have established that higher NPL ratios negatively impact profitability by increasing provisions for loan losses and reducing income from interest-bearing assets. Recent studies, such as those by (Wang & Luo, 2019), have further explored this relationship, indicating that financial liberalization can exacerbate NPL issues if not accompanied by robust regulatory frameworks. Their findings suggest that while liberalization can enhance competition and efficiency, it may also lead to increased risk-taking behaviors among banks, resulting in higher NPL ratios and subsequent profitability challenges. This underscores the importance of effective risk management practices in navigating the complexities introduced by financial liberalization.

The link between asset quality, liquidity, capital adequacy, non-performing loan and financial liberalization is dynamic and significantly influencing bank performance. Maintaining a balance among these elements is crucial for ensuring the stability, profitability, and resilience of banks. Effective regulatory frameworks and prudent risk management practices are essential to maximize the benefits of financial liberalization while mitigating potential downsides. By offering empirical insights into the distinct effects of financial liberalization on Malaysian banks, this study adds to the body of knowledge on financial development and economic policy. To ensure sustainable growth and stability in the banking industry, more effective policy interventions can be informed by the more detailed knowledge of these impacts provided by the quantile analysis technique.

3. Research Methodology

This study considered Malaysian samples, where data was collected from 2012–2022. For this study, the Malaysian market offers an interesting setting for several reasons. The sampling criterion for this study is to include all commercial banks in Malaysia. The variable that will be considered in this study is the bank's performance measured using return on assets (ROA). The ROA is the dependent variable and the independent variable is financial liberalization quantified using the financial freedom index. An index with a value between 0 and 100 reflects the degree to which banks are subject to regulatory constraints on their financial freedom. More freedom and less restrictions are indicated by a higher value (Berger et al., 2009; Sufian and Hassan, 2012). Meanwhile, several control variables that could influence financial stability are asset quality, liquidity, capital adequacy, and non-performing loans. The definitions and measurements of each variable used in this study are shown in Table 1.

Table 1: Definition and sources of variables

Variables	Description	Data source
DV: Bank's Performance (ROA)	Return on Assets (ROA) based on commercial bank	Bank Report
Financial Liberalisation (FL index)	Index of financial liberalisation (FLIB)	Heritage.org
Asset quality (ASQUAL)	Bank Specific data (Impaired loans / Gross loans)	Bank Report
Liquidity (LRATIO)	Bank Specific data (Loan/ Total Deposit and Borrowing)	Bank report
Capital adequacy ratio (CAR)	Bank Specific data (Total Equity / Total Assets)	Bank report
Non-performing loan (NPL)	Bank Specific data (non-performing loan/ Gross loans)	Bank report

This study employs an empirical methodology that utilizes panel data analysis and quantile regression. Quantile regression, initially introduced by Koenker and Bassett in 1978, is a method that expands upon the traditional least squares estimation of the average value to encompass a range of models for various conditional quantile functions. Traditional least squares regression provides an approximation of the conditional mean and conditional median, which are placed at the center of the distribution. However, this only offers an imperfect description of the conditional distribution (Mosteller and Tukey, 1977). Quantile regression is employed to obtain specific details about points in the conditional distribution, apart from the conditional mean. This approach, as demonstrated by Buchinsky (1994, 1995) and Eide and Showalter (1997), effectively reflects the entire distribution. Quantile regression is used to estimate different quantiles within a population.

Furthermore, the quantile regression possesses various advantageous characteristics. The quantile regression estimator minimizes the weighted sum of absolute residuals instead of the sum of squared residuals. As a result, the predicted coefficient vector is not affected by outliers. Furthermore, a quantile regression model utilizes a linear programming form, which facilitates analysis. Furthermore, this technique is especially valuable in cases where the conditional distribution deviates from a typical form, such as being asymmetric, having fat tails, or being truncated. The utilization of quantile regression enables a more comprehensive understanding of the impact of explanatory variables on the dependent variable. The quantile regression method enables us to determine the impact of the covariates at various points in the conditional distribution of the dependent variable.

Specification of the estimation model is used to analyze the relationship between financial liberalization on bank performance, especially for selected commercial banks in Malaysia. The estimation models of this study are as follows:

$$\text{ROA} = \beta_0 + \beta_1 flindex_{it} + \beta_2 asqual_{it} + \beta_3 lratio_{it} + \beta_4 car_{it} + \varepsilon_{it} \quad (1)$$

This study employs quantile regression. Quantile regression (QR) analysis to measure the impact of financial liberalization in conjunction with other factors affecting the bank performance using ROA. Quantile regression (QR) is an extension of the ordinary least squares (OLS) estimation of the conditional mean to a collection of models for various conditional quantile functions and purposes by Koenker and Bassett (1978). Moreover, when the error term is non-normal, the quantile regression estimator can provide a more reliable and effective substitute for OLS (Buchinsky, 1995). Based on equations (1), this study extended the model of Koenker and Bassett (1978) to estimate the model separately for sukuk yield using the QR estimator as follows:

$$\gamma = V_t'\beta_0 + \mu_{\theta t}; Quant_\theta\left(\frac{\gamma_t}{V_t'}\right) = V_t'\beta_\theta \quad (2)$$

Where V' is the regressor set of the financial liberalization and other control variables, $B\theta$ is the slope coefficient quantifying the level of the financial liberalization on the bank performance in quantile θ, is the conditional quantile of bank performance, μ is the error term. The estimator for the QR involves minimizing the sample size β and minimizes the weighted absolute values of the residuals using all available data (Buchinsky, 1995; Koenker & Bassett, 1978), as shown in equations (5) and (6), where the θ-th quantile regression yields $0 < \theta < 1$.

$$Min \sum \Theta \gamma t - V_t' \beta_\theta \sum (1 - \Theta) \gamma t - V_t' \beta_\theta$$

$$\beta \gamma_t \geq V_t' \beta \qquad \gamma_t < V_t' \beta$$

Where γ ≥ V'β and γ < V'β are indicator functions, which describe a positive and a negative value of residuals contingent on the value of θ. As a quantile θ increases from 0 to 1, one can find the total conditional distribution of profitability based on bank performance, which depends on the regressor group of the financial liberalization. Instead of squaring all errors, this method gives a weight of (1-θ) to positive residuals and a weight of (1–θ) to negative residuals. In this study, the regression estimation was performed for five different quantiles based on the 10th, 25th, 50th (median), 75th, and 90th percentiles of the profitability spillover distribution of bank performance. The use of a proxy for return on an asset in the set of regressors implies that even within a given conditional quantile, the response of bank performance spillovers varies depending on the level of financial liberalization.

4. Results and Discussion

The empirical investigation is conducted using estimates. Equations (1) and (2) for the 10th, 25th, 50th (median), 75th and 90th quantiles. This allows us to examine the effects of the explanatory variables at different points in the relationship based on the impact of financial liberalization on bank performance. The empirical results discussion between the independent variables and dependent variables are shown in Table 4. The OLS estimates are shown in the last columns of Table 4 for comparison purposes.

Table 2 provides the descriptive statistics for the variables used in the analysis. Overall, the Descriptive analysis describes and summarizes the characteristics of the data set used. The mean value for all proxies of financial liberalization is 53 for ASQUAL is 2.0882 meanwhile for LRATIO is a positive value of 67.07 and CAR is 15.36. All the variables have a positively skewed distribution with a long right tail. Therefore, the assumption of a normal distribution of the error terms in ordinary least squares (OLS) is not assured and may lead to misleading outcomes. Quantile regression can address these issues and offer a more adaptable and comprehensive analysis for examining the influence of financial liberalization on bank performance. Meanwhile, the value of kurtosis measures the peak or flatness of the distribution of the series. The value equal to 3 shows the normal distribution of the series while the negative value shows the platykurtic series. Based on the Correlation matrix Table 3 is a statistical tool that measures the strength and direction of relationships between dependent and independent variables. The result shows all the indicators have a negative relationship with dependent variables.

Table 2: Descriptive analysis

Variables	Obs.	Mean	Std. dev	Min	Max	Skewness	Kurtosis
ROA	200	.9548	.515599	-.75	2.7	0.3735	0.6163
FL index	200	53	4.5940	50	60	0.1976	0.7271
LRATIO	200	67.072	37.339	2.31	252.38	0.2118	0.6541
ASQUAL	200	2.0882	3.0288	0	32.5	0.0046	0.0051
CAR	200	15.364	13.488	5.75	78.24	0.5195	0.5195
NPL	200	2.0882	3.0288	0	32	0.0393	0.0393

Table 3: Correlation Matrix

Variables	ROAA	FLINDEX	LRATIO	ASQUAL	CAR	NPL
ROA	1.0000					
FLindex	-0.0933	1.0000				
LRATIO	-.0519	-.0654	1.0000			
ASQUAL	-.1561	-.0734	.0654	1.0000		
CAR	-.4177	-.0654	-.2991	-.0940	1.0000	

NPL	-.1561	-.0734	-.1193	1.0000	-.0940	1.0000

Table 4: Regression Result

DV= ROA	$\beta_0 + \beta_1 flindex_{it} + \beta_ asqual_{it} + \beta_3 lratio_{it} + \beta_4 car_{it} + \varepsilon_{it}$					
	10th quantiles	25th quantiles	50th quantiles (Median)	75th quantiles	90th quantiles	OLS
FLlindex	-.01790	-.0058	-.0106**	-.0145***	-.04216	-.0168**
	(-1.21)	(-.94)	(-2.13)	(-3.22)	(-1.52)	(-2.40)
ASQUAL	-.07827*	-.0354	-.04916*	-.01253	-.03323**	-.0252**
	(-1.74)	(-1.31)	(-1.87)	(-0.37)	(-2.01)	(-2.37)
LRATIO	-.0003	-.0076	-.00317***	-.00312***	-.00602***	-.00308***
	(-0.33)	(-.87)	(-4.23)	(-5.66)	(-3.24)	(-3.40)
CAR	-.0226***	-.0182***	-.0157***	-.01314***	-.01446	-.01836***
	(-4.95)	(-4.44)	(-6.91)	(-2.82)	(-0.85)	(-7.35)
CONS	1.903**	1.3974***	2.0575**	2.405***	4.4885**	2.391***
	(2.18)	(3.43)	(7.37)	(9.10)	(2.39)	(6.07)

t statistics in parentheses, p<0.10* p<0.05**, p<0.01***

The empirical investigation is conducted by estimating equations at five quantiles, namely the 10th, 25th, 50th, 75th and 90th. Table 4 reports the results. For comparison purposes, we also provide the OLS estimates which are reported in the last columns of tables. In addition, this study also reports the statistical comparison of regression coefficients indicating the difference in the coefficients for each variable. Not all of the variables show significance for all the quantile phases. Moreover, the inter-quantile coefficient test further confirmed the differences among all of the coefficients in terms of the signs positive and negative. Although most of the coefficient is not significant for all quant, the coefficient of financial liberalization (FLindex) indicates the difference results for quant 10, 25 and 90 which is an insignificant negative sign.

Furthermore, the estimated coefficients on ASQUAL and LRATIO show a decreasing value and are insignificant at the 25th quantiles but for LRATIO it is not significant at the 10th and 25th. Meanwhile, the estimated coefficient on ASQUAL and LRATIO show different results on OLS and quantiles regression thus a significant negative impact on ROA. This implies that the impact of financial liberalization on ROA significantly at the middle of the quantile as supported by Nguyen et al. (2021) demonstrates that, in terms of return on assets (ROA), medium quantile banks in Asia—including Malaysia—benefit the most from deregulation. Bumann, Hermes, and Lensink (2013) in their studies, mentioned that Following liberalization, banks in developing nations show that those in the middle quantile see a significant improvement in ROA. Accordingly, the regression results for CAR have a statistically significant negative impact on ROA for the fourth phase of quantile. This study is also consistent with. Levine (2005) where banks in liberalized environments may experience greater instability and lower profitability due to heightened competition and risk-taking behaviors. This shows that the variable of CAR is influenced by the impact on ROA. The result is the same referred to the approach on OLS and quantile regression. This shows that the role of indicator CAR is vital and aligns with previous studies mentioned (Balami and Chalise, 2023).

Based on the result estimated above it shows that only the middle quantile indicates all the significant variables for both OLS and quantile analysis. According to this, banks operate best in environments with moderate degrees of financial liberalization, where advantages like greater efficiency and competition are realized without posing undue risk or instability (Ghosh, 2014). Banks can benefit from better market conditions and operational efficiency in this medium quantile, which will increase their performance and profitability (Fung & Fung, 2016). However, excessive liberalization could put banks at higher risk of instability, which emphasizes the necessity for a balanced approach. According to Chen et al (2017), quantile regression sheds light on the limitations of ordinary least squares (OLS) in capturing the subtle effects of liberalization. It suggests that policies should be aimed at achieving a balanced level of liberalization to maximize bank performance while preserving stability. Therefore in the Malaysia market to safeguard financial stability Considerable government interference is needed. This study employs a quantile technique to examine the relationship between financial liberalization and return on assets (ROA). It not only gives useful insights into how financial liberalization

affects ROA and their co-movement but also sheds light on the behavior of these variables and the extent to which their reactions endure over time.

5. Conclusion

The empirical findings can be succinctly described as follows: The research identifies a consistent relationship between financial liberalization and return on assets (ROA) using both ordinary least squares (OLS) and quantile regression methods. The results indicate that the impact of financial liberalization on bank performance, as measured by ROA, is particularly significant at the middle quantile. Banks may have increased competition, pressure on profit margins, and difficulties with risk management and regulatory supervision at this moderate degree of liberalization (Liu, 2016). This study emphasizes several significant implications for financial institutions and governments. It implies that the impacts of mild financial liberalization are not consistent at different performance levels, even while it can greatly improve bank performance, especially at the middle quantile. This emphasizes the necessity of customized financial strategies to deal with particular regulatory and risk management issues that banks encounter in different stages of liberalization. To maintain public trust and economic stability, policymakers should balance regulatory control with liberalization. Furthermore, the study supports the use of more complex analytical techniques in financial research and policy development by demonstrating the superiority of quantile regression over conventional OLS methods in capturing the complex effects of financial liberalization. To summarize, while financial liberalization can enhance the performance of Malaysian banks, its impact is not entirely uniform. Both policymakers and banks should carefully assess the many impacts to optimize the advantages of liberalization and protect financial stability.

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