The Uniform Relationship between Managerial Ability and Bank Loan Quality: Does It Hold? Evidence from Quantile Regressions

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Motivation

Managerial Ability

- Critical Role in Banking: Managerial ability is a key determinant of bank performance and financial stability, yet its specific impact on loan quality remains underexplored (**Vo et al.,** 2021).

- Resource-Based View: Managers are considered a valuable resource for banks, and understanding how their ability influences financial outcomes is essential for optimizing organizational performance (**Asyrafi and Lestari,** 2022).

- Emerging Markets Context: The MENA region provides a unique setting to study managerial ability, as banks in emerging markets often face distinct challenges that may amplify the role of effective management (**Mdaghri,** 2022).

Motivation

Loan Quality

- Indicator of Financial Health: Loan quality, measured by non-performing loans (NPLs), is a critical metric for assessing bank stability and risk management effectiveness (**Mdaghri,** 2022).

- Impact on Economic Stability: Poor loan quality can lead to financial crises and economic downturns, making it imperative to understand the factors that influence it (**Bonsall et al.,** 2016)

- Relevance to Emerging Markets: Banks in the MENA region often grapple with higher levels of NPLs, making this study particularly relevant for improving regional financial resilience.

Motivation

Non-Uniform Relationship

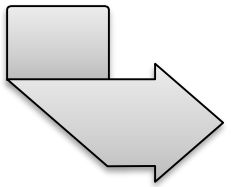
- Limitations of Linear Models: Existing studies often assume a uniform relationship between managerial ability and loan quality (**Asyrafi and Lestari,** 2022; **Vo et al.,** 2021; **Ben Abdesslem et al.** 2022), which may oversimplify the complex dynamics at play.

- Heterogeneity in Risk Levels: The impact of managerial ability may vary significantly across different levels of loan risk, suggesting the need for a non-uniform approach to capture these nuances.

- Methodological Innovation: By employing quantile regression, this study addresses the limitations of traditional methods and provides a more granular understanding of the relationship between managerial ability and loan quality.

Research question & Hypothesis

Key Question:
Does the impact of managerial ability (MA) on bank loan quality vary across different levels of loan risk?



Hypothesis 1: The relationship between managerial ability and loan quality is non-uniform and depends on bank risk level.

Research Design

Data Collection

- BANKSCOPE
- World Bank
- Annual reports

Method

- Quantile Regression
- Quantile on Quantile Regression

Sample

- 126 Banks over 15 years period (2006-2020)

Country	Number of Banks	Country	Number of Banks
ALGERIA	7	SYRIA	2
TUNISIA	11	PALESTINE	1
LIBYA	4	OMAN	5
MAURITANIA	5	LEBENON	10
MOROCCO	4	KUWAIT	5
TURKEY	17	JORDAN	8
UAE	12	IRAQ	2
QATAR	4	EGYPT	15
KSA	8	BAHRAIN	5
YEMEN	1	**TOTAL**	126

Methodology

Model

$$NPLs_{it}=\alpha_i + \alpha_1 MA_{i,t-1} + \beta \sum Control_{i,t-1} + Year\_FE + Bank\_FE + \varepsilon_{it}$$

Where:

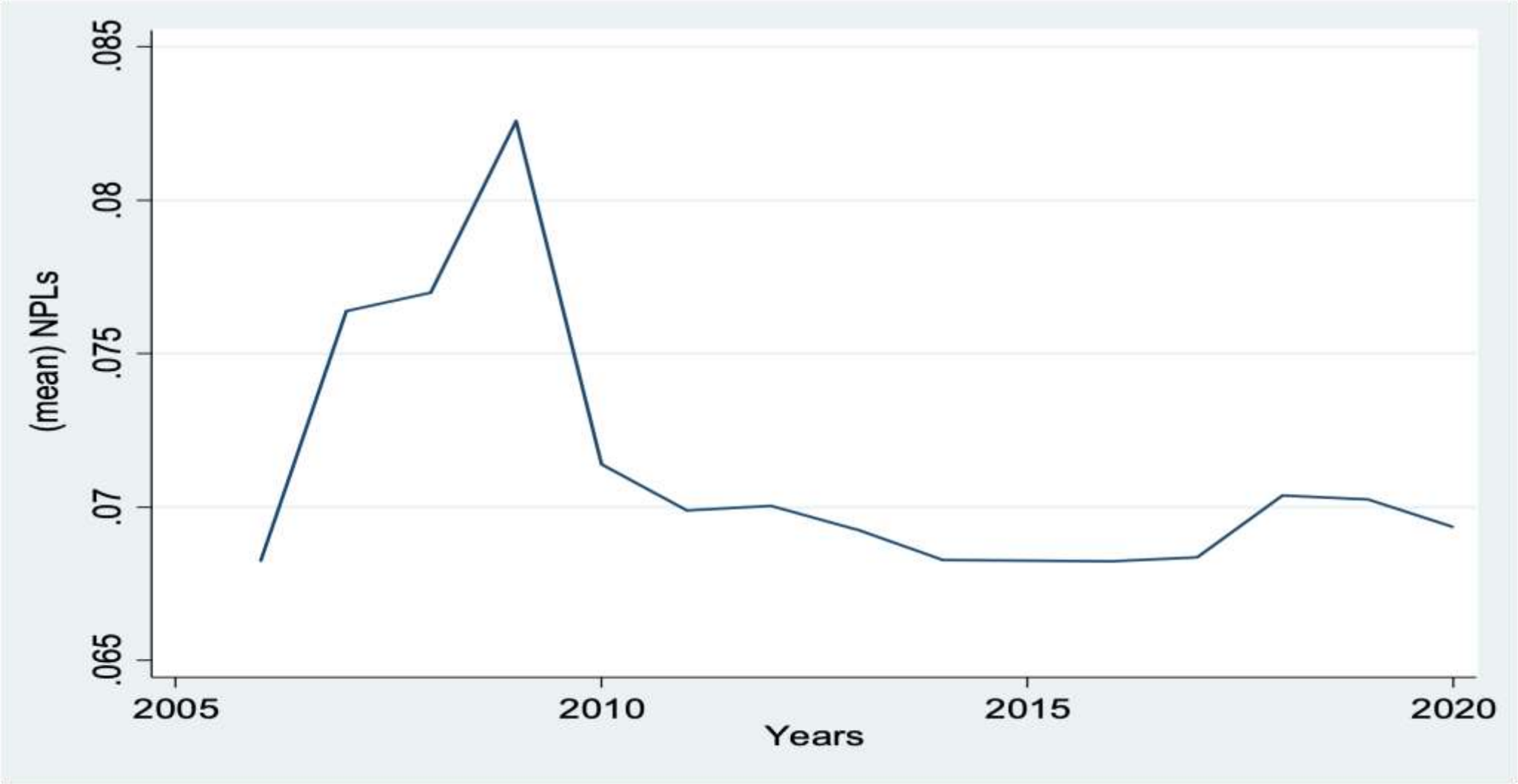
NPLs is the dependent variable that represents loan quality. ***MA*** is the independent variable that represents managerial ability. ***Control*** is a set of control variables (*SIZE* is bank size. *ROA* is bank profitability. *DEP* is deposits. *CAP* is bank capitalization. *GDP* is the gross domestic product. *INFL* represents the inflation. *CRISES* is binary variable equal to one in the period 2007–2009 and 2020, zero otherwise). $\boldsymbol{\alpha_i}$ is the individual fixed effects. $\boldsymbol{\varepsilon_{it}}$ is the random standard error.

Methodology

Variables

Variables	Definition	Measure
	Dependent variable	
NPLs	Loan quality	The ratio of NPLs to the total amount of loans
	Independent variable	
MA	Managerial ability	The managerial ability score of Demerjian et al. (2012)
	Control variables	
SIZE	Bank size	The logarithm of bank assets
ROA	Bank profitability	The ratio of net income to total assets
DEP	Deposits	The proportion of total deposits to total assets
CAP	Capitalization	The ratio of equity to total assets
GDP	GDP growth	Annual GDP growth rate
INFL	Inflation	Consumer Price Index
CRISES	Financial crises and Covid-19	Binary variable equal to one in the period 2007–2009 and 2020, zero otherwise

Methodology



Results

Results (Quantile Regression)

Variables	Main quantiles			
	0.25	0.5	0.75	0.95
The effect of Managerial ability on Loan Quality	0.014 (0.117)	-0.012 (0.026)**	-0.020 (0.050)*	0.038 (0.022)**

	Main quantiles		
	0.05 versus 0.95	0.25 versus 0.75	0.45 versus 0.55
Tests of the equality of slope estimates across various quantiles	22.34 (0.000)***	14.66 (0.001)***	8.85 (0.087)*

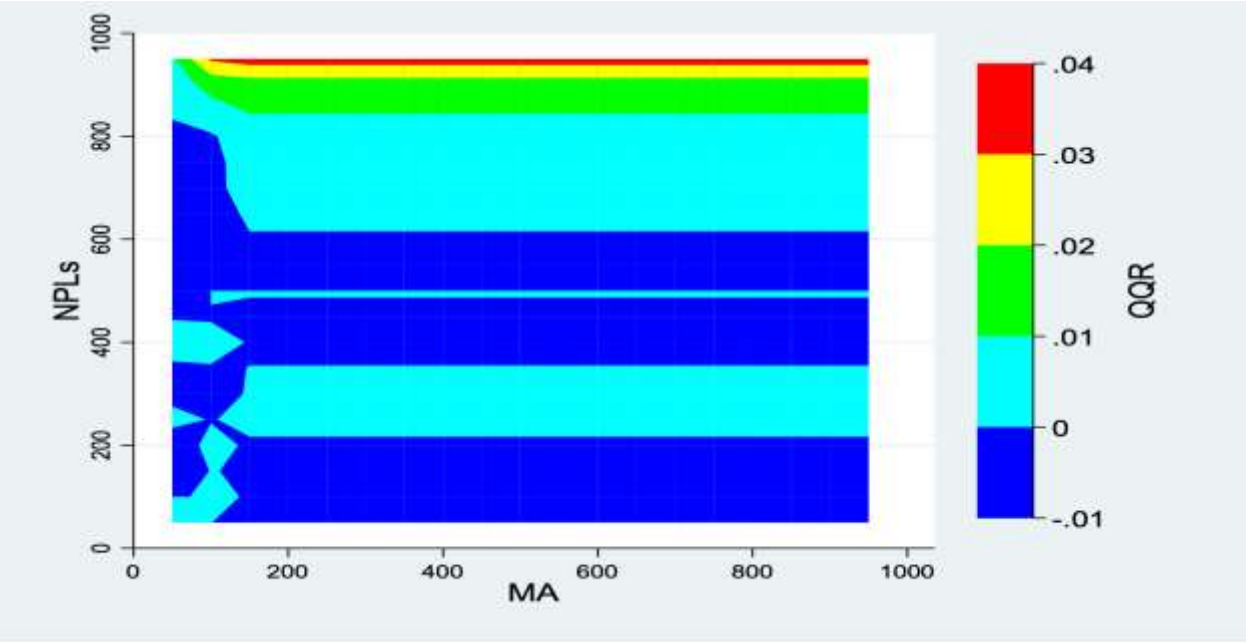
	Main quantiles		
	0.30 versus 0.35	0.50 versus 0.55	0.90 versus 0.95
Tests of the equality of slope estimates across neighboring quantiles	3.47 (0.237)	2.61 (0.229)	1.12 (0.194)

H1: The relationship between managerial ability and loan quality is non-uniform and depends on bank risk level.

Results

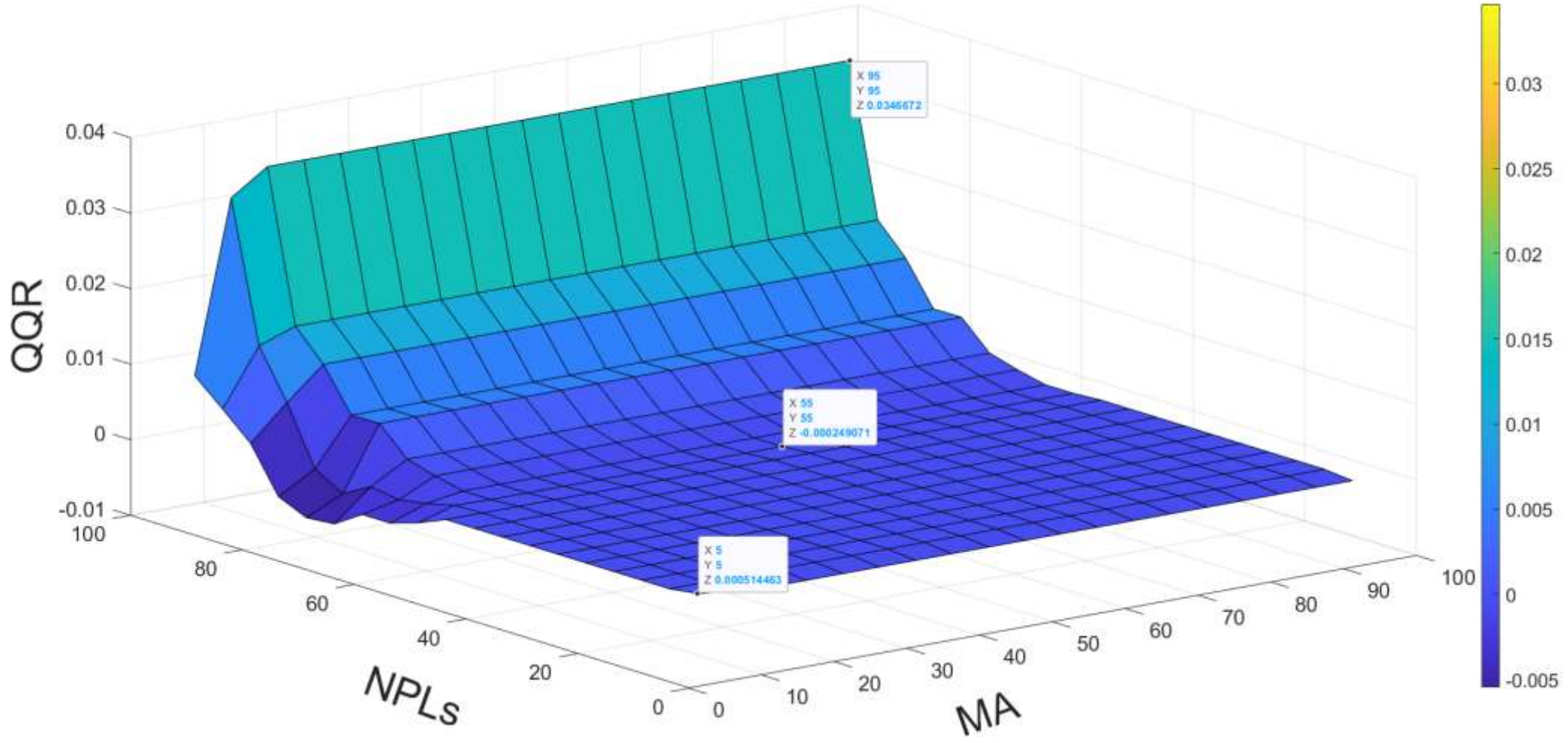
Results (Quantile on Quantile Regression)

- To validate the use of quantile approach quality and give a more detailed picture in the relationship between managerial ability and bank loan, we apply QQR.
- QQR examines the relationship between the quantiles of the independent and dependent variables.



Results

Results (Quantile on Quantile Regression)



Results

Rrobustness Check

Sub-sampling

North African Countries		Middle East countries	
Quantile	Estimate (p-value)	**Quantile**	Estimate (p-value)
0.25	0.024	**0.25**	0.034
	(0.179)		(0.227)
0.5	-0.025	**0.5**	-0.019
	(0.020)**		(0.037)**
0.75	-0.031	**0.75**	-0.015
	(0.041)**		(0.036)**
0.95	0.071	**0.95**	0.016
	(0.022)**		(0.002)***
The robust standard errors are reported. *Bank fixed-effects: yes* *Time fixed-effects: yes*			

Results

Rrobustness Check

Endogeneity

Quantile	Estimate (p-value)
0.25	0.024 (0.211)
0.5	-0.014 (0.001)***
0.75	-0.022 (0.041)**
0.95	0.035 (0.000)***

The robust standard errors are reported. The lagged variables as instruments.

Bank fixed-effects: yes

Time fixed-effects: yes

Conclusion

- This study shows that skilled managers make efficient loans when banks have a moderate risk level.
- These managers are better at assessing timing and potential returns, as well as synthesizing information into accurate forecasts about the risks (**Demerjian et al.,** 2012).
- Therefore, such managers will use their talent to choose the best lending schema to improved loan quality.
- When banks have a high level of risk, managers might focus excessively on their personal interests, often leading to decisions that increase agency costs (**Huang et al.,** 2011; **Lin et al.,** 2005) and bad lending choices.

Contributions

Theoretical Implications

- **Advances Understanding of Managerial Ability:** Expands the theoretical framework of managerial ability by incorporating heterogeneity in its effects on financial outcomes.

- **Methodological Contribution**: Introduces quantile regression and quantile-on-quantile regression as robust tools for analyzing non-monotonic relationships in finance and accounting research.

- **Enriches Literature on Loan Quality:** Highlights the importance of considering risk-specific effects when studying financial outcomes.

Contributions

Practical Implications

- **For Bank Managers:** Suggests that managers may need additional support or resources in high-risk scenarios to effectively improve loan quality.

- **For Regulators and Policymakers:** Emphasizes the need for managerial training and incentive structures that are adaptable to different levels of loan risk.

- **For Investors and Stakeholders:** Offers insights into how managerial ability influences bank stability and loan portfolio quality, which can inform investment decisions.

- **For Emerging Markets:** Provides actionable insights for banks in the MENA region to improve risk management practices and financial resilience.

- **For Financial Stability:** Suggests that improving managerial effectiveness could contribute to broader financial system stability.

Thank you !

Discussion

MA measure

First, we use DEA to estimate a bank's technical efficiency score. To do, we adopt the three inputs and two outputs for the optimization program.

Banks collect liabilities and use capital and labor to transform these funds into loans and other assets. Hence, we use as inputs: fixed assets, labor costs, and deposits; as outputs: loans and other earning assets.

$$MAX_{it} = \frac{loan+other\ earning\ assets}{fixed\ assets+labor\ costs+personal\ expense} \qquad (1)$$

Second, we estimate MA by regressing the efficiency score on a set of bank-specific characteristics (bank size, age, leverage) and country characteristics (inflation and GDP).

We estimate the following Tobit model to exclude bank and country characteristics:

$$BankEfficiency_{it} = \alpha_0 + \alpha_1 size_{it} + \alpha_2 Age_{it} + \alpha_3 LEV_{it} + \alpha_4 INFL_{jt} + \alpha_5 GDP_{jt} + Yeardummies + Bankdummies + \varepsilon_{it} \qquad (2)$$

Where the dependent variable is bank efficiency measured between zero and one. Size is the natural logarithm of total assets. Age is the natural logarithm of bank age. Lev is the Leverage ratio. INFL is the annual inflation rate. GDP is gross domestic product.

The residual from Equation (2) is our main measure of MA (Demerjian et al. 2012).

Discussion

QR equations

We define the conditional quantile regression model as:

$$y_{it} = x'_{it} * \beta_\theta + u_{\theta it}$$
$$Quantile_\theta(y_{it} \mid x_{it}) \equiv \inf\{y : F_{it}(y|x)\theta\} = x'_{it} * \beta_\theta,$$
$$Quantile_\theta(u_{\theta it} \mid x_{it}) = 0 \qquad (1)$$

Where $Quantile_\theta(y_{it} \mid x_{it})$ gives the θth conditional quantile of y_{it} on x_{it}. β_θ is the unknown vector of parameters to be estimated for different values of in θ, (0< θ <1). $u_{\theta it}$ is the error term, a continuously differentiable c.d.f. (cumulative density function) of $F_{u\theta}$ (.|x) and a density function $f_{u\theta}$ (.|x). The value F_{it}(.|x) indicates the conditional distribution of the y conditional on x.

Then we use the following equation to obtain the estimator for β_θ :

$$Min \sum_{it:u_{\theta it}>0} \theta \times \mid u_{\theta it} \mid + \sum_{it:u_{\theta it}<0} (1-\theta) \times \mid u_{\theta it} \mid =$$
$$\sum_{it:y_{it}-x'_{it}*\beta_\theta>0} \theta \times \mid y_{it} - x'_{it} * \beta_\theta \mid + \sum_{it:y_{it}-x'_{it}*\beta_\theta<0} (1-\theta) \times \mid y_{it} - x'_{it} * \beta_\theta \mid \qquad (2)$$