

The Impact of Reserves Debt Ratio on Profitability of Commercial Banks: Lesson from Nigeria

Ahmed Rufai Mohammad^{#1}, Mohamad Helmi Bin Hidthiir^{*2}, Alias Mat Nor⁺³

[#]*Ph.D. Student School of Economics Finance and Banking, University Utara Malaysia
06010 UUM, Sintok, Kedah, Malaysia*

¹elrufail8@gmail.com

^{*}*Senior Lecturer School of Economics Finance and Banking, University Utara Malaysia
06010 UUM, Sintok, Kedah, Malaysia*

²m.helmi@uum.edu.my

⁺*Senior Lecturer Islamic Business School, University Utara Malaysia
06010 UUM, Sintok, Kedah, Malaysia*

³alias@uum.edu.my

Abstract - This study attempts to explore the impact of the change in international reserves to external debt ratio positions of Nigeria on the profitability of domestic deposit money financial institutions. Using the sample of 14 listed banks operating in the market from the period 2004 to 2014, in the study we employed dynamic fixed effect (DFA) methodology to the banking institution. The result reported that a change in international reserves to debt ration position has a significant impact on bank returns during the short run period. However, in the long run, position the change affect banking return negatively.

Keywords - *International reserve to debt ratio, Rate of financial solvency, Return on investor's equity, profitability.*

1. Introduction

Over a decade, studies on the influence of financial strength on economic progress, national debt, foreign capital inflow and many more macroeconomic variables that represent the stability of the economy have been conducted by academics and researchers in various part of the globe. However, the impact of countries financial strength has received little consideration and is not well investigated, more especially on the effects of country financial strength on the commercial banking industry. This piece of work targeted to bridge the literature gap.

The pattern and structure of a country financial strength known as a reserve to debt ratio or the country financial solvency rate have a significant

influence on the life of the population, public organizations and other private institution more especially lending institutions. Thus this causal relationship its impact and direction are worthy of investigation.

According to Calafell and Del Bosque (2002) reserve to debt ratio is an indicator of the country economy's solvency position. The higher figure of reserve to short-term external debt indicate the distance to vulnerability to crisis, while lower value reduces the length of the country to vulnerability to external speculative shocks because of low excess to foreign exchange.

Focusing our attention on the international reserve to debt ratio and banking sector profitability is relevant and appropriate as there a casual association between societal comfort improvement of a country and institutions more especially the lending financial institutions. In essence, banks facilitate the intermediate financial resources which are germane to the computable flow of the economy. Similarly, international reserves to debt ratio positively enhance the effort of the bank in creating capital in the country and vice vasa if otherwise.

In their empirical work, Bairamli and Kostoglou (2010) confirmed that an efficient banking system is germane to national resources mobilization and promotion of competitive advantage in the international financial market. However, the high profile of reserve to debt ratio is evidence that the economy is the distance from the crisis and prudent macroeconomic strategy is on the right direction. While if its lows the debt profile overweight the reserve, the economy shows imprudent policy and

with a possibility of crisis, which demoralized savings and jeopardized banking profitability. Colossal debt profile depresses households to save their surpluses, and banking sector are made to obtain risky funds which add to their risk exposure consequently distortions are diffused into the financial structure due to the high profile of external debt over reserves.

The remainder of this study is reorganized into four sections. Section 2 reviews the related literature on the causes of banking profitability. Section 3 sketches the methodology of the study. Section 4 presents the results and Section 5 summarizes and concludes the work.

2. Literature Review

A competitive financial system is demanded to ensure that banks remain a formidable force for disbursing financial resource from the hand surplus unit as saving into deficit unit for fostering investment and boosting economic growth. In the nexus of bank performance literature, a significant number of studies have been carried out to examine the role of various factors responsible for determining the performance of the lending institutions. These determining factor of bank performance can be bank specific or macroeconomic (Athanasoglou, Delis, & Staikouras, 2006; Menicucci & Paolucci, 2016a; Tan & Floros, 2012).

However due to the variation in the internal and external factors some banks performed better and earned a significant amount of returns, while others played below expectation (Dragnić, 2014; Duraj & Moci, 2015; Gul, Irshad, & Zaman, 2011). How much the difference in performance come from internal attributes which are under the influence of bank directors, how much is outside the power of bank management.

There are several kinds of literature on the influence of internal bank determinants on profitability. From the angle of early scholarly work such as (Bourke, 1989; Demirgu-kunt & Huizinga, 2000; Haslem, 1968; Molyneux & Thornton, 1992; Short, 1979), recently various studies have shown the influence of some factors that determine the profitability of the credit market in many economies. Some literature centered on country-specific variables such as (Ali, Akhtar, & Ahmed, 2011; Gul et al., 2011; Saeed, 2014), while some other practical studies focus on the cross country panel (Pasiouras & Kosmidou, 2007; Staikouras & Wood, 2004).

The outcome of outlined experimental works shows a more significant divergence because of the variation in the time frame, datasets and the nature of the evaluated economy (Menicucci & Paolucci, 2016b). The internal determinant falls under the control of management and sees as bank internal or microeconomic factor (Gungor, 2007). On the external factors, it entails economic and environmental attributes that influence bank operational performance. Variable selection in any studies depends on the nature and reason of conducting the survey. (World Bank Group, 2015)

The bank-specific factors are empirically studied, and a significant number of previous literature acknowledge that well-capitalized credit institute is the distance to default costs and this leads to higher earnings in Europe (Abreu & Mendes, 2001). On a similar note, (Căpraru & Ilnatov, 2014) using the datasets of the European economy, Romania, Hungary, Poland, Czech Republic, and Bulgaria supported the findings of (Abreu & Mendes, 2001).

In another European study, Athanasoglou, Brissimis, and Delis, (2008) measuring bank internal and macroeconomic factors on the performance of Greek credit firms. They acknowledged the status of capital in explaining the profitability, while other external determinants such as GDP and other cyclical factors of control, and influence banking profitability.

In United States case, Berger (1995) examine the relationship between bank performance regarding return on investors equity (ROE) and capital adequacy, using historical bank data from 1983-1992 and the concluded that capital leads to higher bank profitability. While on the empirical work of (Osborne, Fuertes, & Milne, 2009) found that bank with excess capital relative to the requirement exhibit a strong negative association between bank leverage and profitability (ROE), indicating a reduction in capital target remains the best option for banks to attained future return on equity.

On the contest of multi-economies investigation, Bashir (2011) examining determinants of Sharia banks profitability across the Middle East between 1993-1998. Adopting the combination of bank factors and macroeconomic variable of controls the study indicated that higher capital and liquidity ratios attract greater bank profitability. While on the environmental variables of taxation and stock market growth has negative and positive on credit firm profitability. On the contrary, Hassan and Bashir

(2003) working on the dataset of 21 Islamic banks found the more excellent value of the loan to asset affecting banking profitability negatively.

On the contest of African sub-region, Combey and Togbenou (2017) employing the bank data of Togo from 2006 – 2015. However, the study adopted pool mean group method of estimation established that, in the short run period, the return on shareholders' equity and return on asset of the Togolese banks are inversely related to macroeconomic variables. Likewise in the long run GDP, real exchange rate affect ROA and ROE negatively and significant. However, inflation shows a no relation with ROA Togolese banks, but on the contest of ROE, the relationship appeared very negative with the inflationary rate.

Based on the previous literature, very few studies are conducted on the influence of international reserve to debt ratio of a country on the domestic bank's profitability. To contribute to the near vacuum in the literature, we consider the rate of Nigerian international reserve to short-term debt in our analysis of banking profitability.

3. Methodology

3.1 Data explanation

The data for the study derived from Bloomberg database. The sample banks consist of 14 deposit-taking commercial banks operating in Nigeria. The study period is covering the span 11 years from 2004-2014, the return on equity and CAMEL catalog is selected as the method of analysis. We combine the data collected from the cooperate level with World Bank macroeconomic data of the sample country. Table 1 represents the variables selected, their measurement and prediction in the study.

Table 1. Variable and Measurements

| Variables | Measurement | Prediction | Source |
|----------------------------|------------------------------------|------------|------------|
| Dependent Variable | | | |
| Return on investors Equity | Net income to average total equity | - | Bloomberg |
| Explanatory variable | | | |
| International Reserve | Total reserved to % | ? | World Bank |

| | | | |
|------------------------------|--------------------------------------|---|------------|
| Debt ratio | total external debt | | |
| Control Variables | | | |
| Capitalization | Equity to assets ratio | + | Bloomberg |
| Asset quality | Loan loss reserve to loan | - | Bloomberg |
| Managerial efficiency | Operating cost of operating income | | Bloomberg |
| Liquidity | Net loan to asset | + | Bloomberg |
| Bank size | Log of total asset | + | Bloomberg |
| Diversification | Non-interest income/operating income | | Bloomberg |
| Inflation as a Macroeconomic | Annual CPI rate | - | World Bank |
| Total Assets | Log of total assets | | Bloomberg |

Furthermore, all the sampled banks are listed in the Nigerian Stock exchange, henceforth the performance of these credit institutions is highly essential for the investors. Since the majority of the banks have available data for the study period, we go for balance panel. For the study, a total of 154 observations is obtained.

Furthermore, figure 1.1 indicate an international reserve to debt ratio in Nigeria from 2004-2014. In 2004, the preserve of the country can only pay 43.2 percent of the total debt, showing the lowest rate over the sample period. While the figure achieves its highest ratio in 2006 indicating the country reserve can pay debt four times (444.36), the same trend is also recorded in 2007 and 2008 respectively. But from 2009 down to 2013 the figure keeps on decreasing have to 2014 where the international reserves can only pay debt one time, this is the lowest value since 2007.

3.2 Method of analysis

This piece of work investigates the relationship and impact of international reserves quantitatively to debt on the earnings of the banking sector as it is related to return on equity.

When assessing the profitability of the banking sector, with ROE we are confronted with numerous challenges. The endogeneity problem, most banks upsurges their equity through plug back capital (retain earnings). Another significant issue is the heterogeneity diagonally the banking industry, which could be very substantial in Nigeria as corporate governance code is very new (Imeokparia, 2013; Olayiwola, 2010). Change in the price of natural resource (hydrocarbon) may lead to highly persistent profit in the banking sector (Nwani, Iheanacho, Okogbue, & McMillan, 2016).

However, to tackle the underline problem the study goes beyond the traditional method of mostly adopted by preceding literature on the bank's profitability. Majority of the early schoolwork's rely on fixed or random effect to assess the relationships (6). More so, in this piece of work, we embrace DFE which is developed and used by (Hsiao, 1989).

The model specification

$$y_{it} = \alpha_{it} + \sum \rho x_{it} + \sum \rho x_{mit} + \epsilon_{it} \quad \epsilon_{it} = v_{it} + u_{it} \quad (1)$$

Where y_{it} stand for the profitability of the bank i at time t , with $i=1, \dots, N$, $t=1, \dots, T$, α is constant, ρx_{it} 's stand for explanatory of bank specific, ρx_{mit} is macroeconomic variable and ϵ_{it} is the disturbance term, with v_{it} unobserved bank variables weight and u_{it} are the eccentric error.

All the explanatory variables are rearranged and expound in the coming model (eq 2)

$$y_{it} = \alpha_i + \sum CAR_{it} + \sum ASQ_{it} + \sum EFF_{it} + \sum TA_{it} + \sum LIQ_{it} + \sum DIV_{it} + \sum RFS_{it} + \sum INF_{it} + \epsilon_{it} \quad (2)$$

3.3 A priori anticipations

The a priori probability of this work is that when the value of debt out weight international reserves, the situation will depress the profitability of the banking industry and the scenario need to be investigated. However what is not clear to policy regulators and investors, is the magnitude of the effect of the rate of financial strength on the banking industry.

3.4 Estimation technique

The first procedure conducted in this study is the unit root test to ratify whether variables are stationary and integrated in the same order or not and to determine the model to be used for the analysis. However, the result shows all the variables are mixed some are stationary at the level, while others are at first differences. Based on this, dynamic panel model is used for the analysis. The dynamic panel model is of three types: Pool Mean Group (PMG) which makes short-run coefficient to be heterogeneous and the long run coefficient homogeneous. Mean Group (MG) which makes all coefficients whether in the short run or the long run heterogeneous. Dynamic Fixed Effect (DFE) which makes all factors whether in the short run or the long run homogeneous (Frank & Blackburne, 2007).

The approach implies that specific condition must be followed as for Hausman test and behavior of the data. The Stata software could not allow for PMG and MG estimations due to the nature of the data which implies that the cross sections are homogeneous therefore DFE is used for the analysis.

4. Results and Findings

Table 1 presents the descriptive statistics of the variable; the table shows that the mean of ROE is 0.12, while the mean of RFS is 5.37. They also have a standard deviation value of 0.18 and 0.65, respectively. The respective standard deviations of ROE and RFS are lower than their respective mean value, which implies that the distribution of the separate series is closer to the mean.

Table 1: Descriptive Statistics of the Variables

| | ROE2 | CAR2 | EFF2 | LTA | DIV | ASQ2 | LIQ2 | INF2 | LRFS |
|--------------|--------|--------|----------|--------|----------|----------|-------|-------|--------|
| Mean | 0.12 | 0.12 | 0.77 | 5.64 | 0.73 | 0.11 | 0.41 | 0.11 | 5.37 |
| Median | 0.15 | 0.12 | 0.66 | 5.79 | 0.44 | 0.02 | 0.41 | 0.12 | 5.45 |
| Maximum | 0.49 | 0.30 | 6.76 | 6.64 | 17.94 | 3.63 | 0.67 | 0.18 | 6.10 |
| Minimum | -0.81 | -0.31 | 0.04 | 3.28 | 0.04 | -0.01 | 0.14 | 0.05 | 3.77 |
| Std. Dev. | 0.18 | 0.07 | 0.56 | 0.68 | 1.67 | 0.40 | 0.11 | 0.03 | 0.65 |
| Skewness | -2.34 | -1.83 | 8.32 | -1.29 | 8.24 | 6.24 | -0.09 | 0.24 | -1.12 |
| Kurtosis | 11.21 | 13.89 | 87.27 | 4.64 | 78.88 | 47.35 | 2.44 | 2.48 | 3.77 |
| Jarque-Bera | 573.31 | 846.84 | 47347.41 | 59.63 | 38692.50 | 13622.55 | 2.23 | 3.24 | 36.10 |
| Probability | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.33 | 0.20 | 0.00 |
| Sum | 17.92 | 19.18 | 117.93 | 868.26 | 113.09 | 16.98 | 63.17 | 17.21 | 826.65 |
| Sum Sq. Dev. | 4.75 | 0.72 | 47.92 | 69.98 | 429.19 | 24.45 | 1.75 | 0.18 | 65.35 |
| Observations | 154 | 154 | 154 | 154 | 154 | 154 | 154 | 154 | 154 |

The correlation matrix of the variables is presented in table 2. The table shows that the correlation between the ROE and the rest of the variables is relatively weak as none of the correlation coefficients is up to 0.70. The correlation between ROE in one hand and CAR, EFF and RFS in the other hand is significant (P<0.05). However, the correlation between the ROE and the rest of the

variable is insignificant as the ($P > 0.05$). The correlation between the ROE and CAR is positive, while the correlation between ROE and EFF and RFS is negative.

Table 2. Correlation Analysis of the Variables

| Prob | ROE2 | CAR2 | EFF2 | LTA | DIV | ASQ2 | LIQ2 | INF2 | LRFS |
|------|--------|--------|--------|--------|--------|--------|--------|--------|------|
| ROE2 | 1.00 | | | | | | | | |
| | ---- | | | | | | | | |
| CAR2 | 0.25 | 1.00 | | | | | | | |
| | (0.00) | ---- | | | | | | | |
| EFF2 | -0.35 | -0.57 | 1.00 | | | | | | |
| | (0.00) | (0.00) | ---- | | | | | | |
| LTA | 0.00 | 0.08 | -0.11 | 1.00 | | | | | |
| | (0.95) | (0.35) | (0.17) | ---- | | | | | |
| DIV | 0.06 | 0.04 | 0.01 | 0.16 | 1.00 | | | | |
| | (0.47) | (0.59) | (0.89) | (0.05) | ---- | | | | |
| ASQ2 | -0.09 | -0.11 | 0.01 | -0.44 | -0.04 | 1.00 | | | |
| | (0.27) | (0.16) | (0.93) | (0.00) | (0.66) | ---- | | | |
| LIQ2 | -0.04 | 0.21 | -0.11 | -0.08 | 0.10 | 0.20 | 1.00 | | |
| | (0.62) | (0.01) | (0.19) | (0.33) | (0.20) | (0.01) | ---- | | |
| INF2 | 0.06 | -0.01 | 0.00 | -0.22 | 0.10 | -0.05 | 0.01 | 1.00 | |
| | (0.48) | (0.88) | (0.98) | (0.01) | (0.20) | (0.50) | (0.94) | ---- | |
| LRFS | -0.17 | 0.08 | 0.07 | 0.18 | -0.15 | 0.03 | 0.00 | -0.61 | 1.00 |
| | (0.04) | (0.35) | (0.40) | (0.03) | (0.07) | (0.76) | (0.95) | (0.00) | ---- |

The unit root tests conducted indicate that the variables are mixed stationary, the result is presented in Table 3

Table 3. Result of Unit Root Test

| Test type / Variables | Levin, Lin & Chu | | Im, Pesaran & Shin | | ADF - Fisher | | PP - Fisher | |
|-----------------------|---------------------|-----------------------|---------------------|-----------------------|----------------------|-----------------------|----------------------|-----------------------|
| | Level | 1 st Diff. | Level | 1 st Diff. | Level | 1 st Diff. | Level | 1 st Diff. |
| ASQ | -5.361* (0.0000) | - | -2.881* (0.0020) | - | 46.5617* (0.0079) | - | 45.4522* (0.0105) | - |
| CAR | -6.526* (0.0000) | - | -3.943* (0.0000) | - | 60.274* (0.0004) | - | 59.168* (0.0005) | - |
| DIV | -32.23* (0.0000) | - | -12.32* (0.0000) | - | 88.882* (0.0000) | - | 73.094* (0.0000) | - |
| EFF | -5.152* (0.0000) | - | -1.841* (0.0328) | - | 41.028* (0.0534) | - | 47.0038* (0.0137) | - |
| INF | -18.107 (0.0000) | - | -8.824* (0.0000) | - | 129.025* (0.0000) | - | 52.464* (0.0026) | - |
| LIQ | -4.242* (0.0000) | -6.321* (0.0000) | -1.694* (0.0452) | -5.903* (0.0000) | 38.477 (0.0897) | 46.4460* (0.0000) | 4.35982 (0.8233) | 78.2967* (0.0000) |
| RFS | -6.150* (0.0000) | - | -4.048* (0.0000) | - | 67.296* (0.0000) | - | 40.293* (0.0623) | - |
| ROE | -5.795* (0.0000) | - | -3.189* (0.0007) | - | 52.566* (0.0033) | - | 56.722* (0.0010) | - |

Source: Authors' computation, 2018

The results of the estimation are presented in Table 4; the table shows that during the short run the rate of financial solvency of Nigeria is significant at one percent. It positively affects the return on equity of the banks in the country. The coefficient 0.1575 signifies that one percent increase in the rate of financial solvency will lead to 0.15 percent increase in return on equity in the short run, while one percent decrease in rate of financial solvency of the country will lead to 0.15 percent decrease in return on equity of the banks in short run. This could be because, during the short run, the government generated revenue are collected and kept by the domestic banks. However, the inflation rate is also significant and positively affecting the return on equity of the banks

during the short run period. One percent increase/decrease in the rate of inflation will increase/decrease the return on equity by approximately 1.9 percent. This could be due to the fact in the short run bank have excess funds to performed their intermediation function by giving out loans which will result in the increase in the supply chain of money in the economy. The speed of adjustment towards long-run equilibrium is 93.4 percent and significant at one percent. The rest of the variables are relatively insignificant.

The Table also indicated that in the long run period the rate of financial solvency is significant at five percent and inversely affecting the return on equity of the banks in the country. Specifically, one percent change in rate of financial solvency, in the long run, will lead to a change in return on equity of the banks by 0.11 percent in the opposite direction. This could be because during the long run period government may be building their strength by saving more in their international reserves and using their internally generated revenue deposited with the domestic lending institutions for their daily expenditures. Thus, the inflationary rate in the country is significant and adversely affecting the return on equity of the banks in the long run period, which specifically change the profitability of the banking sector by 2.87 percent adversely if it varies by one percent. This could be because the government withdraws its funds from the local banks, which reduces the liquidity of the banks to grant loans.

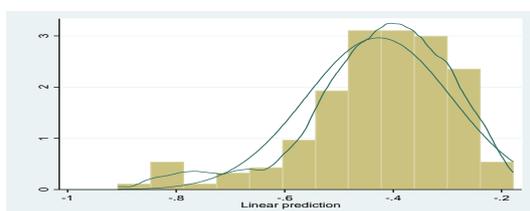
On the other hand, public expenditure is inflationary. However the asset quality provision is significant and adversely affecting the return on equity of the banks, the coefficient of the variable signified that one percent change in asset quality provision of the banks would lead to the inverse change in their profitability by 0.11 percent in the long run period. This could be due to the fact that if the provision for loan loss to gross loan increase it will deterioration the profitability returns of the banks.

Table 4. Short Run and Long Run Results

| Short-Run Results | | | | |
|-------------------|-------------|------------|---------|-------|
| Variable | Coefficient | Std. Error | Z value | Prob. |
| D(LRFS) | 0.1574721* | 0.046681 | 3.37 | 0.001 |
| D(ASQ) | 0.019814 | 0.059479 | 0.33 | 0.739 |
| D(CAR) | 0.254698 | 0.29616 | 0.86 | 0.390 |
| D(EFF) | 0.022064 | 0.031717 | 0.64 | 0.524 |
| D(LTA) | -0.055982 | 0.077190 | -0.73 | 0.468 |
| D(DIV) | 0.02371 | 0.01859 | 1.27 | 0.202 |
| D(LIQ) | -0.164945 | 0.193546 | -0.85 | 0.394 |
| D(INF) | 1.897798 | 0.594590 | 3.19 | 0.001 |
| CoIntEq(-1) | -0.93400 | 0.09789 | -10.29 | 0.000 |
| Long-Run Results | | | | |
| LRFS | -0.109555* | 0.044936 | -2.44 | 0.015 |
| CAR | 0.646742 | 0.396785 | 1.63 | 0.103 |
| EFF | 0.008922 | 0.482082 | 0.19 | 0.853 |
| LTA | 0.090339 | 0.065569 | 1.38 | 0.168 |
| DIV | 0.002859 | 0.020023 | 0.14 | 0.886 |
| ASQ | -0.108554 | 0.055044 | -1.97 | 0.049 |
| LIQ | -0.256000 | 0.244773 | -1.05 | 0.296 |
| INF | -2.869059 | 0.911538 | -3.15 | 0.002 |
| C | 0.5024884 | 0.4508 | 1.11 | 0.266 |

4.1 Post Estimation

The model is free from serial correlation as shown by Wooldridge test, for the autocorrelation in a panel having F statistic of 1.540 and probability 0.2366. Thus, Figure 1 indicate the normality of the estimated model.

Figure 1. Normality Test

5. Conclusion

This study observes the impact of the rate of financial solvency of the country on the profitability of Nigerian banks. In the scope, elements affecting lending institutions profitability have been put under scrutiny using dynamic fixed effect model, the sample of 14 banks functioning in Nigeria from the period 2004-2014 is observed. Furthermore, our estimated result found that an increase in the rate of financial solvency of leads to a rise in banks returns on equity in the short run, while an inverse relation is said to be observed in the long term. More so, the empirical outcome also revealed that loan loss reserve to gross loan (ASQ) is another essential bank-specific factor that determines banking profitability in Nigeria but negatively. Similarly, the macroeconomic variable inflation shows a significant and negative

relation with return on bank equity. While in the short run period rate of financial solvency and inflation demonstrate a positive and significant relationship with banks profitability.

It has been concluded during the long run the rate of financial solvency hurts the profitability of the banking industry, as the change in financial solvency will lead to the change in the profitability of the banks in the opposite direction. However, the outcome provides exciting insights into physiognomies and practice of the Nigerian deposit banks. In this respect, some recommendations can stand to be accommodating for banks supervisors and management in an attempt to maintain sustainable and stable banking practice in the country.

The findings of the study offer other significant implications. Firstly, The Nigerian banks should diversify their operations not to rely so heavily on government tax and oil revenue collections as a deposit. It is previously observed that Nigerian banks depend so much on government account deposits. Secondly, the result offered a new paradigm on the determinants of banking profitability in Nigeria. This study saves as an extension of prior literature, as it tries to bridge the existing literature gap in enhancing the profitability of the banking sector in Nigeria.

Finding the impact of the rate of financial solvency on the stability of the deposit money banks is recommended, as the study will bring more light on how to handle financial crises in the future.

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