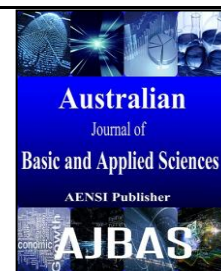




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### An Empirical Analysis of Liquidity Risk and Performance in Malaysia Banks

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#### ABSTRACT

The nature of banking business exposed banks to various risks which culminate in the form of liquidity risks. Banks with high liquidity risk may face difficulties in fulfilling its financial obligation to the customers, extending their business and eventually may affect the overall performance of the bank. Understanding the critical effects of liquidity risk, this study aimed at examining the liquidity risk exposure of Malaysian banks and its effects on the banks' performance. It is hypothesized that high liquidity risk will decrease the bank performance. This study used three liquidity risk indicators and the study period is confined to 2005-2013. The results suggest that the Malaysian banks do not involve in excessive lending, have a reasonable level of liquid assets and good capital standing. However, the regression results revealed that not all of the liquidity risk indicators affect the banks' performance. Loan to deposit ratio has no significant effects on changes in the bank's performance, liquid asset to total assets imposed opportunity costs to the banks while capital to asset ratio provide mixed results with the performance measures. Overall, the regression results show that the effects of liquidity risk on Malaysian banks' performance are not clear-cut, and varies with the performance measures used.

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#### INTRODUCTION

Assessing the performance of banks is vital and necessary for the continuation of the bank's activities and ability to confront the continuing challenges. The performance of banks differs from one bank to another and this is mainly influenced by factors such as management policy of the banks and the market they served which determine their exposure to risk (Alzorqan, 2014). The nature of banking business exposes banks to various of risks. There are abundant of risks faced by banks such as credit risk, operational risk, interest rate risk, market risk and foreign exchange risk which may culminate in the form of liquidity risk (Brunnermeier and Yogo, 2009). The varied nature of banking business, such as receiving deposits and extending loans, facilitate payments and settlement systems, and support the transfer of goods and services exposed banks to a high liquidity risk (Arif and Anees, 2012). Liquidity risk emerges from the inability of banks to accommodate decreases in liabilities or to fund increases in assets (Tabari *et al.*, 2013). Duttweiler (2009) noted that the inability of banks to raise liquidity can be attributed to a funding liquidity risk that is caused by the maturity mismatched between

cash inflows and outflows, and the sudden unexpected liquidity needs arising from contingency conditions. Liquidity risk may emerge not only from banks' balance sheet business, but also from lending and funding business conducted through off-balance sheet items (Imbierowicz and Rauch, 2014).

Liquidity risk may adversely affect both bank earnings and capital. Jenkinson (2008) contends that most banking activity depends on a bank's ability to provide liquidity to its customers and lack of enough liquidity may affect not only the performance of a bank but also its reputation. Arif and Anees (2012) indicate that liquidity risk is a potential for loss to an institution while Goodhart (2008) contends that liquidity and insolvency are twins in banking, where high exposure to liquidity risk will cause banks to become insolvent. Under critical conditions, the inability of banks to provide liquidity even results in bank's bankruptcy (Tabari *et al.*, 2013). Imbierowicz and Rauch (2014) indicate that the majority of commercial bank failures during financial crisis is due to high exposure to liquidity risk while Chaplin *et al.*, (2000) noted that liquidity risk reduced banks' profitability. The negative effects of liquidity risk on bank performance are supported by previous studies such as Falconer (2001), Diamond and Rajan (2005),

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Zheng and Sheng (2008), Kosmidou *et al.*, (2008), Arif and Anees (2012) and Alzorqan (2014). However, there are also some studies that found positive effects of liquidity risk on bank performance, such as Bourke (1989), Molyneux and Thornton (1992), Berger (1995), Demirguc-Kunt *et al.*, (1998), Barth *et al.*, (2003) and Abor (2005). Hence, the effect of liquidity risk on bank performance is inconclusive and cannot be generalised.

Comptroller of the Currency (2001) contends that liquidity risk has become a serious challenge in the modern era bank. The effects of liquidity risk on bank performance do not only apply to banks in developed countries but also banks in developing countries. Unfortunately, most of the empirical literature on bank liquidity and its effects on bank performance tends to be focused mainly on the case of advanced economies and very limited on the developing countries (Roman and Sargu, 2014; Imbierowicz and Rauch, 2014; Zheng and Shen, 2008). Hence, this situation creates gaps on the empirical evidence of the effects of liquidity risk on bank performance in developing countries. In addition, most studies on liquidity risk in banking have been focusing on the liability side of a bank's balance sheet and less attention on liquidity risk that arise from the asset side (Arif and Anees, 2012). As a consequence, many important questions regarding liquidity risk that arises from the asset side of the balance sheet (i.e., bank loan, cash and short term funds, deposits and placement with banks) and bank performance remain unanswered; Are banks in a developing country, particularly Malaysia, expose to high liquidity risk?; What is the effect of liquidity risk on the banks' performance?. Hence, this study tries to answer these questions by empirically analysing the liquidity risk exposure of Malaysian banks and examining the relationship between liquidity risk and performance of Malaysian banks. As a country with rapid economic growth and highly dependent on banks as a source of funding, the liquidity and health of the Malaysian banks are very crucial.

On that basis, the present study is struggling to examine the liquidity risk exposure of the Malaysian banks and its effects on the banks performance. The result of the study is beneficial to (i) the banking institutions, as it highlights the critical effects of liquidity risk on bank performance and (ii) policy maker, as it would provide inputs in which may be useful in formulating rules and regulations related to the banking institutions.

## MATERIALS AND METHODS

In order to analyse the effect of liquidity risk on the bank performance in Malaysia, data from the entire population of commercial banks were collected. There are 27 commercial banks in

Malaysia and the data collected were confined to the period of 2005-2013. It is expected that the period of study is sufficient to reflect the effects of liquidity risk on the bank performance. However, due to problem of data availability, six banks had been dropped. These banks have been identified to be established after 2010, which do not match the period of the study. Hence, this has left the study with 21 banks.

In measuring the bank performance, return on assets (ROA) and return on equity (ROE) are used. This is consistent with Najid and Rahman (2011), Alkhatib and Harsheh (2012) and Rose and Hudgins (2013), who indicate that ROA and ROE are the best indicator to measure performance. In addition, these measurements have been extensively used by other studies as measurement for a bank's performance; among others, Almumani (2013), Tabari *et al.*, (2013), Roman and Sargu (2014) and Imbierowicz and Rauch (2014). As for the liquidity risk, this study employed three liquidity indicators represented liquidity exposure from the asset-side and equity-side of a bank's balance sheet. This study assumed that liability risk does not only exist from the liability-side of a bank's balance sheet, but also from the asset-side and equity-side. The liability-side risk arises from transactions whereby a creditor, depositor or other claim holder demands cash in exchange for a claim. An asset-side risk and equity-side risk on the other hand arise from the activities of banks particularly the funding activities. The asset-side risk is assessed by dividing the banks total loans by its total deposits, and liquid assets by total assets. The higher the ratio of loan to deposit, the more the bank is relying on its deposits to finance its lending activities and thus, the lower is the banks' liquidity. The high ratio of loans to deposits also implies the loan growth of the banks where the higher ratio suggests excessive lending activities of banks; which may also indicate a high liquidity risk exposure. As for liquid assets to total assets, the higher ratio indicates a more liquid condition of the bank and thus, the lower is the liquidity risk. High liquid assets to total assets indicates the ability of the banks to withstand financial shocks and therefore, lower its probability of default (Angora and Roulet, 2011). The equity-side risk is assessed by dividing the banks' capital to its total assets. Capital includes funds contributed by owners, retained earnings, general and specific reserves, provisions and valuation adjustments. Capital is crucial as it provides a buffer against a shortfall in cash flow, can be used to pay off unpaid debts and act as a cushion against the risk of failure by absorbing losses until the management can address the bank's problem and restore its profitability. Hence, a lower capital ratio indicates that the bank faces liquidity problem where it is unable to absorb losses which might threaten the banks solvency (Frag *et al.*, 2013). The dependent and independent variables of the study are described

in detail in Table 1.

**Table 1.** Summary of Variables and the Measurement

| Variables                         | Symbol | Measurement   |
|-----------------------------------|--------|---|
| Return on Asset                   | ROA    | Net income / total asset  |
| Return on Equity                  | ROE    | Net income / total equity   |
| Loan to deposit ratio             | LTD    | Loans, advances and financing / deposits from customer + deposit and placement of banks in other financial institutions |
| Liquid asset to total asset ratio | LATA   | Cash and short term funds + deposits and placement with banks / total assets  |
| Capital to asset ratio            | CAR    | Total equity / total assets   |

### Data Analysis and Hypothesis:

Data for this study are collected from the annual reports of all commercial banks in Malaysia. All banks are analysed on the charter banks and not on the bank holding company level. This is because this study intends to measure the actual liquidity risk exposure of the bank while for bank holding company, the data come from the combination of various companies under the holding company. Therefore, data from the holding company do not reflect the actual liquidity risk faced by the bank. Based on the concept of liquidity risk, and findings of previous studies on liquidity risk and bank performance, this study hypothesized the relationship between liquidity risk and performance of Malaysian banks as follows;

H1: There is a negative relationship between loan to deposit and bank performance

H2: There is a positive relationship between liquid asset to total asset and bank performance

H3: There is a positive relationship between capital to asset ratio and bank performance

The econometric model used to test the hypotheses of this study is shown as below;

$$BP = \alpha_0 + \beta_1LTD_{it} + \beta_2LATA_{it} + \beta_3CAR_{it} + e_{it}$$

Where,

BP = bank performance (ROA and ROE)

i=bank

t=time

Before conducting the regression test between liquidity indicators and bank performance, this study runs several tests such as normality, multicollinearity, homoscedasticity and serial correlation test. This is to ensure that the expected value of the study is equal to the true value and has minimum variance. Testing for normality, it is found that data of the study deviate from the normality assumptions. However, Gujarati (2003) noted that the normality assumption does not assume a critical role and maybe relaxed in a large sample. The author

defines large sample as more than 100 observations while Pallant (2007) and Hair *et al.*, (2006) define large sample as more than 30 observations. As this study involves 189 observations, the normality assumptions should not cause any major problems, and can be relaxed. Further, the multicollinearity test shows no sign of multicollinearity problems while Breusch-Pagan Godfrey test and Lagrange Multiplier test show that heteroscedasticity and auto-correlation problem respectively, exist in the data. Next, Hausman test, which is carried out to identify the best model for panel data analysis shows that the fixed effects model is more appropriate for this study.

### Results:

#### Descriptive Statistics:

Analysing 21 commercial banks in Malaysia for the period of 2005-2013, the descriptive statistics are shown as in Table 2. Among the three liquidity risk indicators, loan to deposit ratio is found to have the highest average which is about 63.8%. The result shows the high dependency of the banks on their own deposits as a source of finance to their customers. However, there is no sign of excessive lending activities of the banks. Wong and Lope (1999) noted that the benchmark ratio acceptable by international standards to represent excessive lending is 80%. Next, the banks have an average of 25.8% liquid assets to total assets, which indicates that about a quarter of banks' total assets are comprised of liquid assets. Bordeleau and Graham (2010) contend that there is no ideal ratio of liquid assets holding, as long as the marginal benefit of holding additional liquid assets outweighs the opportunity costs, the ratio is acceptable. Capital to asset ratio of the banks recorded an average of 10.6%, indicating a higher ratio than the Basel requirement of 8%. Rose and Hudgins (2013) noted that banks with more than 10% capital ratio is considered as well capitalized.

**Table 2:** Summary Statistics for the dependent and independent variables used in the analysis

| Variables | Mean    | Median  | Standard Deviation | Min     | Max     |
|-----------|---------|---------|--------------------|---------|---------|
| ROA       | 0.02998 | 0.02942 | 0.00870            | 0.01030 | 0.05152 |
| ROE       | 0.34975 | 0.35427 | 0.17816            | 0.04115 | 1.08430 |
| LTD       | 0.63770 | 0.70961 | 0.32536            | 0.00740 | 2.22774 |
| LATA      | 0.25779 | 0.20386 | 0.17653            | 0.02803 | 0.83026 |
| CAR       | 0.10587 | 0.08720 | 0.05672            | 0.03556 | 0.35386 |

### Empirical Results:

Taking into account problems that exists in the data, a Regression with GLS estimation, which is

more appropriate for non-normal data is carried out. The heteroscedasticity and auto-correlation problem are corrected by using White's General

Heteroscedasticity and AR (1) respectively. The regression results of the liquidity indicators and

performance of Malaysian banks are shown as in Table 3.

**Table 3:** The Relation between Liquidity Indicators and Bank Performance

| Variables               | ROA                       | ROE                      |
|-------------------------|---------------------------|--------------------------|
| C                       | 0.02231**<br>(11.83090)   | 0.35004**<br>(15.69299)  |
| LTD                     | 0.00052<br>(0.30257)      | -0.00201<br>(-0.10562)   |
| LATA                    | -0.02184**<br>(-10.83875) | -0.15391**<br>(-6.84352) |
| CAR                     | 0.09212**<br>(12.50947)   | -0.43191**<br>(-5.23631) |
| AR(1)                   | 0.81839**<br>(42.94016)   | 0.82314**<br>(61.27812)  |
| R <sup>2</sup>          | 0.602824                  | 0.867438                 |
| Adjusted R <sup>2</sup> | 0.599000                  | 0.866162                 |
| F Statistics            | 157.6587                  | 679.7196                 |
| Sig. F Statistics       | 0.00000                   | 0.00000                  |
| Durbin Watson           | 2.39459                   | 2.07786                  |

Note: \*significance at  $p < 0.05$ ; \*\*significance at  $p < 0.01$

According to Table 3, not all liquidity risk indicators of this study have a significant effect on the performance of banks. The results of loan to deposit ratio do not support the hypothesis of the study where it is found that loan to deposit ratio has insignificant effects to changes in the bank performance. The insignificant results could be due to the lending policy of the banks where the loan to deposit ratio is at a moderate level which is 63.8%. Similarly, prior study such as Samad and Hassan (2000) and Tesfaye (2012), who found insignificant results of loan to deposit ratio to bank performance, also reported moderate level of ratios which are 63% and 76% respectively. As for liquid assets to total asset ratio and capital ratio, Table 3 shows that both liquidity risk indicators have a significant effect on bank performance. However, both liquid asset to total asset ratio and capital ratio do not support the hypothesis. The negative result of liquid asset to total asset implies the disadvantage of banks in holding high liquid assets. Holding high liquid assets imposes an opportunity cost on the bank given to their low return relative to other assets, thereby having a negative effect on profitability (Bordeleau and Graham, 2010). Further, the results also imply the maturity structure of the banks' portfolio, which reflect excessive maturity unbalances (Angora and Roulet, 2011). As for the capital ratio, the mixed results, which is positive significant effects with ROA and negative significant effects with ROE, cause its effects on bank performance cannot be inferred.

### Conclusions:

The statistical results show no sign of high liquidity exposure among Malaysian banks during the study period. The results indicate that the banks do not involve in excessive lending, have reasonable liquid assets to total assets and are well capitalized. However, the three liquidity indicators present different effects on bank performance. Out of the

three liquidity indicators, only liquid asset to total asset and capital ratio have significant effects on changes in bank performance over the study period. The negative effects of liquid asset to total asset on performance imply that holding highly liquid assets imposed opportunity cost to the banks and thus, reduce the performance of the banks. As for capital ratio, the mixed results on ROA and ROE cause its effect on bank performance cannot be concluded. Overall, the results show that the effects of liquidity risk on the performance of Malaysian banks are not clear-cut, and varies with the measure of liquidity used. The liquidity measures may differ due to factors such as bank regulations and policy which might influence the way banks handle their liquidity level and thus, the effects of liquidity risk on the bank's performance. Hence, further investigation is needed to clarify the relationship.

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