

Net Stable Funding Ratio and Commercial Banks Profitability

Rasidah Mohd Said⁺

Graduate School of Business, Universiti Kebangsaan Malaysia

Abstract. The impact of the new liquidity framework proposed under Basel III, namely the net stable funding ratio (NSFR) on commercial banks profitability is analysed in this study. Using panel data of eight Malaysian commercial banks for the period 2005-2011, the results show that this new liquidity ratio is an important factor in affecting the sample banks' profitability. The ability of banks in managing the stability of their funding sources as well as liquidity of its assets is an advantage to them and is translated into higher profitability. In addition, this study also confirms finding of previous studies that relates bank-specific determinants and profitability.

Keywords: Net Stable Funding Ratio, Liquidity, Profitability, Banking.

1. Introduction

The collapse of US subprime mortgage market in 2007 has not only affected the country but also the global financial system. The episode of major banks failure following this event has depicted the importance of liquidity of the world banking institutions. As a result banking regulation was overhauled, resulted in the introduction of Basel III, which will over time replace Basel II. The new reform Basel III aims to improve the banking sector's ability to absorb shocks arising from financial or economic crisis. In addition to changes in capital requirements, Basel III also contains two entirely new minimum standards for funding liquidity: the liquidity coverage ratio (LCR) and the net stable funding ratio (NSFR). Briefly, the LCR imposes tighter control on short-term liquidity flows, while the NSFR aims at reducing the maturity mismatch between assets and liabilities of the banks. These ratios are the landmark requirement of the new Basel III and apply to all banks if they are engaged in international banking activities.

The LCR is the ratio of liquid assets to estimated cash outflow under stress conditions. The standard requires that the value of this ratio be never below than 100 percent and that banks are expected to meet this requirement continuously. The aim is to ensure the resilience of banks to adverse shocks. NSFR is defined as the ratio of banks' available stable funding (ASF) to the banks' required stable funding (RSF). Stable funding is defined as those types and amounts of equity and liability financing expected to be reliable sources of funds over a period of one year under conditions of extended stress. To determine the value of ASF, a factor ranging from 0 to 100 percent is assigned to each particular type of equity and liability, which are then multiplied by the available amount in each category and the value of ASF is the sum of the weighted amounts. The same principle goes for the RSF where the amount of each type of assets held and funded by the institution is multiplied by an assigned factor for each category and the value of RSF is the sum of the weighted amounts. Like LCR standard, this standard also requires that the value of the ratio ASF over RSF to be greater than 100 percent to ensure that banks hold sufficient stable funding to match their medium and long-term lending over the evaluated period.

Reform initiatives taken after the onset of the 1997 Asian financial crisis have improved the strength of banking institutions in the region. Liquidity ratio, cash flows, liquid assets and reserve holdings became commonly available instruments for liquidity management for banking institutions. As a result, banking institutions were in much better liquidity position during the 2007/2008 global financial crisis. The region has witnessed an abundant of funding liquidity where deposits continued to grow during the crisis. For

⁺ Corresponding author. Tel.: +603 89215744; fax: + 60389213161.
E-mail address: rasidah@ukm.my.

instance, Indonesia, Thailand, Malaysia and Singapore experienced deposit growth of 18.5 percent, 7.8 percent, 9.5 percent and 10.90 percent per annum, respectively for the period 2007-2011¹. In Malaysia, the new Central Bank of Malaysia Act 2009 provides a greater supervisory mandate for the country's central bank, Bank Negara Malaysia (BNM). The quality and the degree of enforcement of these regulations has resulted the banking institutions in the country to be able to provide deposit growth of 17.7 percent from the year the new Act came into force in 2009 to 2011.

Although the country's banking system was not badly affected by the recent global crisis, the central bank of Malaysia, Bank Negara Malaysia (BNM) supports the implementation of LCR and NSFR. The BNM targets to implement them gradually beginning in 2013 until 2019 as agreed globally and in accordance with the time line set under Basel III. Prior to the formal implementation of the new standards by banks in the country, BNM conducted an observation period to assess the impact of the new standards and assisted bank institutions with the appropriate transition arrangements where necessary. During this observation period, the central bank expects that banking institutions in this country would be able to determine and adopt strategies that could positively impact their capital and liquidity levels so as to maintain their capital and liquidity targets as required by the new standards.

As pointed out earlier, the purpose of the new standards proposed in Basel III is to increase banks' self-insurance against liquidity crises and hence preventing the pressure of solvency problems which promote systemic stability. However, there has been concern that the standards are likely to pose even bigger challenges to banks. Banks will have to face higher costs in order to meet these requirements and the costs can come in two forms: costs of adjustments the banks' balance sheet and costs of gathering necessary data, reporting the ratios, monitoring and assessing maturity mismatches and many more. In what way these new reforms influence performance of the banking institutions is therefore a concern that needs to be addressed. This paper therefore, attempts to evaluate the two new proposed liquidity standards and assesses whether they help alleviate the profitability of Malaysian banking institutions. However, since the calculation of the value of LCR requires information that is not publicly available, only NSFR will be considered in this paper.

2. Literature Review

Studies dealing with bank profitability have found several variables such as size, expenses and risk as some of the important determinants. Size is introduced to reflect the economies or diseconomies of scale of the banking institutions in the market (e.g. Smirlock (1985), Demirguc-Kunt and Huizinga (2000), Short (1979), Bikker and Hu (2002), Goddard et al. (2004), Berger et al. (1987)), while bank expenses reflect the efficiency or inefficiency of the management of the banks (Bourke (1989) and Molyneux and Thornton (1992)). Risk can be divided into several dimensions: credit risk, market risk and liquidity risk. According to the definition of the Basel Committee on Banking Supervision (1997), liquidity risk arises from the inability of a bank to accommodate decreases in liabilities or to fund increases in assets. When a bank has inadequate liquidity, it cannot obtain sufficient funds, either by increasing liabilities or by converting assets promptly, at a reasonable cost, thereby affecting profitability. For example, Molyneux and Thornton (1992) found that there is a negative and significant relationship between the level of liquidity and profitability. Study by Pasiouras and Kosmidou (2007) is consistent with that of Molyneux and Thornton (1992) where they found that the ratio net loans to customer and short term funding is statistically significant and positively related to the profitability of their sample banks, indicating a negative relationship between bank profitability and the level of liquid assets held by the banks. In contrast, Bourke (1989) concluded that liquidity ratios were positively associated with profitability when employing international data for 1972 to 1981.

Generally, banks lacking stable and cheap funds will have to use liquid assets or more external funding to meet the demand of fund, and thus increases its cost of funding. As it may appear, the relationship between cost and profit is straightforward implying that the higher the cost banks have to incur in obtaining

¹ Alvarez et. al (2013)

funds, the lower will be their profits. This is confirmed by Pasiouras and Kosmidou (2007) who argue that banks with lower needs of external funding face lower costs resulting in higher profitability. This argument is consistent with previous studies by Berger (1995), Goddard et. al. (2004) and Kosmidou (2008).

Most previous literature discuss the liquidity-profit relationship in the realm of capital. Berger (1995), for example, through the concept of “expected bankruptcy cost hypothesis” suggests that banks with high levels of capitals experience decrease in fundings costs to the extent that it is more than enough to offset the direct decline in the expected profitability. Drawing together two concepts introduced by Morris and Shin (2010), ‘insolvency risk’ and ‘illiquidity risk’, Bordeleau and Graham (2010) assert that if the ‘expected bankruptcy cost hypothesis’ is indeed true, then holding more liquid assets will likely improve banks’ profitability through the decrease in their probability of default. Applying this hypothesis on 55 US bank holding companies and 10 Canadian banks for the period 1977 to 2009, Bordeleau and Graham (2010) found that their hypothesis is supported. Earlier, Kosmidou et. al (2005) found that the higher the capital strength of banks, the lower the need for external fundings, and therefore the higher the profitability of the banks. The increase in this profitability is also attributable to the lower cost of bankruptcy which reduces banks’ cost of funding.

From the above discussion, although literature surrounding the analysis of liquidity on banks’ profitability are aplenty, empirical work that include liquidity as an explanatory variable that directly affect banks’ profitability is limited. Thus, this paper deals with this issue within the framework of new liquidity standards as proposed by Basle III.

3. Data and Empirical Estimation

Three commonly used measures of profit performance are employed in this study: *ROA*, *ROE* and *NIM*. Two groups of determinants are employed. The group of bank-specific determinants of profitability involves liquidity (*NSFR*), operating efficiency (*COST*), capital strength (*EQUITY*), asset quality (*LOSSRATIO*) and size (*SIZE*). The second group of determinants is used to examine the impact of environment on these banks profitability, and they are the real gross domestic product (*RGDP*) growth and the annual inflation rate (*INF*). The Breusch-Pagan Lagrange Multiplier (BPLM) test was first perform on the data to decide between a random effects (RE) regression and pooled Ordinary Least Squares (POLS) regression. With low value of LM test statistics of 0.310, 0.153 and 0.761 respectively for NIM, ROA and ROE as dependent variables, confirms the non-existence of random effects in the dataset and hence provide evidence that the estimation using random effect method does not seem to be the appropriate method to test the relationship. With no surprise, the Hausman specification tests performed on the dataset also rejects the null hypothesis of random effects model as the preferred model for the analysis, and therefore strengthen the decision to drop the random effects method from the analysis.² This leaves us with two methods, namely the POLS and Fixed Effects regression, for testing the relationship between bank-specific factors and profitability. To determine if fixed effects model is appropriate and preferred over POLS, the redundant likelihood ratio test was performed on the dataset. Chi-square statistics of 41.152, 19.354, and 16.610 for dependent variables NIM, ROA and ROE, respectively, suggest that fixed effect model is indeed appropriate for the analysis of the bank-specific factor and profit link. Table 1 and Table 2 present the regression results of POLS and Fixed Effect estimations, respectively.

Based on the results presented in Table 1 and Table 2, the explanatory power of the fixed effects model is always higher (R^2 equals to 0.586 for NIM, 0.663 for ROA and 0.708 for ROE) compared to the POLS method (R^2 equals to 0.148 for NIM, 0.474 for ROA and 0.602 for ROE), which highlights the significant

² When performing the Hausman test, the Hausman statistic was set to zero for the dependent variable NIM. Although this can be misleading, this means that the random effects model is rejected for the dataset and hence signals in favor of the fixed effects model. As for ROA and ROE, the chi-square statistics were 14.425 and 12.299, large enough to conclude that the fixed effects method is the preferred method.

contribution of the banks fixed effects. With the exception of NIM as dependent variable in the POLS estimation, *F*-statistics are significant at the 1% level.

The model is estimated using the following equation:

$$\pi_{it} = \alpha + \beta_1 NSFR_{it} + \beta_2 COST_{it} + \beta_3 EQUITY_{it} + \beta_4 LOSSRATIO_{it} + \beta_5 SIZE_{it} + \beta_6 RGDP_t + \beta_7 INF_t + \varepsilon_{it}$$

where

i refers to an individual bank, *t* refers to year, π_{it} the dependent variables that refers to ROA, ROE and NIM; α is the intercept of the regression; $NSFR_{it}$, $COST_{it}$, $EQUITY_{it}$, $LOSSRATIO_{it}$ and $SIZE_{it}$ are the bank-specific factors for bank *i* on year *t*; $RGDP_t$ and INF_t are the environment factors on year *t*, and ε_{it} is an error term.

Table 1: Pooled Ordinary Least Square Estimations

Variable	A. Dependent : NIM		B. Dependent : ROA		C. Dependent : ROE	
	Coeff.	T-stat	Coeff.	T-stat	Coeff.	T-stat
Constant	4.071	3.386***	-1.189	-0.912	-15.974	-0.987
NSFR	-0.008	-1.987*	0.004	0.859	0.085	1.654
COST	-0.019	-2.176**	-0.022	-2.323**	-0.413	-3.441***
EQUITY	0.001	0.022	0.096	2.178**	1.154	2.115**
LOSSRATIO	0.037	1.319	-0.051	-1.670	-0.673	-1.785*
SIZE	0.043	0.548	0.133	1.571	1.993	1.894*
RGDP	-0.019	-0.851	0.008	0.317	-0.038	-0.123
INF	0.001	0.029	0.043	0.934	0.723	1.274
R-squared	0.148		0.474		0.602	
<i>F</i> -value	1.194		6.185***		10.375***	
Observations	56		56		56	

***, **, * are significant at 1, 5, and 10 percent significance levels, respectively.

From the POLS regression, two bank-specific factors, NSFR and COST, are found to be significantly negative related with performance as measured by NIM. NSFR, however, does not have any significant relationship with ROA and ROE. COST, on the other hand, produces consistent relationship with ROA and ROE. In addition to COST, the coefficient of EQUITY is positive and significant for ROA and ROE, implying that well-capitalized banks experience higher profits. The negative and significant impact of LOSSRATIO on profitability of banks is only true when ROE is used as a proxy for profitability. This supports the conditional wisdom that suggests that higher loan loss provisioning produces lower return to the banks. This is also true for SIZE, where the positive and significant coefficient of this variable at 10 percent with ROE implies the support of the economies of scale hypothesis.

The model is estimated using the following equation:

$$\pi_{it} = \alpha_{it} + \beta_1 NSFR_{it} + \beta_2 COST_{it} + \beta_3 EQUITY_{it} + \beta_4 LOSSRATIO_{it} + \beta_5 SIZE_{it} + \beta_6 RGDP_t + \beta_7 INF_t + \varepsilon_{it}$$

where

i refers to an individual bank, *t* refers to year, π_{it} the dependent variables that refers to ROA, ROE and NIM; α_{it} is the intercept of bank *i* at year *t*; $NSFR_{it}$, $COST_{it}$, $EQUITY_{it}$, $LOSSRATIO_{it}$ and $SIZE_{it}$ are the bank-specific factors for bank *i* on year *t*; $RGDP_t$ and INF_t are the environment factors on year *t*, and ε_{it} is an error term.

From the fixed effect estimation results in Table 2, COST appears to be highly negative significant for all measures of profitability. Thus, this confirms the operational efficiency of banks in managing their cost which in turns produces higher profits. The same goes with EQUITY which produces similar result as in the POLS estimation. As with the effect of loan loss provision, the significant coefficient of LOSSRATIO is only true when NIM is the proxy for profitability measure. The positive coefficient on LOSSRATIO for NIM

suggests that loan loss provisioning improves profits of banks. Turning to the structural liquidity which is central to this study, the coefficients of NSFR is positive and significant for all measures of profitability.

Finally, both estimations show that the effect of macroeconomic factors on profitability is not significant and hence do not provide support to the argument of positive association between macroeconomic conditions and financial sectors performance which is consistent with the findings of Dietrich et. al (2010).

Table 2: Fixed Effect Estimations

Variable	A. Dependent : NIM		B. Dependent : ROA		C. Dependent : ROE	
	Coeff.	T-stat	Coeff.	T-stat	Coeff.	T-stat
Constant	7.584	2.777**	-5.809	-1.708*	-94.015	-2.082**
NSFR	0.008	1.843*	0.011	2.148**	0.181	2.636**
COST	-0.054	-5.114**	-0.063	-4.768***	-0.829	-4.741***
EQUITY	0.022	0.678	0.079	1.965*	1.176	2.199**
LOSSRATIO	0.069	2.675**	-0.037	-1.152	-0.208	-0.489
SIZE	-0.322	-1.269	0.637	2.016*	9.327	2.222**
RGDP	-0.026	-1.511	-0.002	0.070	-0.103	-0.363
INF	-0.006	-0.175	0.045	1.130	0.833	1.566
R-squared	0.586		0.663		0.708	
F-value	4.154***		5.773***		7.096***	
Observations	56		56		56	

***, **, * are significant at 1, 5, and 10 percent significance levels, respectively.

4. Conclusion

The 2007/2008 financial market crisis that began in the United States with the collapse of the subprime mortgage market has led to the decline in solvency of the banking system. This has drawn the Basel Committee on Banking Supervision (BCBS) to propose Basel III, which imposed more stringent rules and regulations for banks to address their liquidity positions. With the introduction of the net stable funding ratio (NSFR), banks are expected to have high quality and stable source of funding. This requires bank to retire from investing in low- and medium-quality assets and instead focus on high-quality assets and at the same time maintaining their profitability. In this paper, whether NSFR is related to various bank performance indicators is analysed. Other explanatory variables that have been introduced in earlier studies were also included in the regressions. The results are in line with earlier studies, where findings in those earlier studies are confirmed. For instance, there exists a positive relationship between equity and profit, and size of banks and profit, and a negative relationship between cost to income ratio and profit. The results also meet the expectation of the NSFR-profit link. There appears to be a positive relationship between NSFR and all three indicators of performance. Although banks switched from low- and medium-quality assets to high quality assets which may have reduced their net interest margin, they were still able to maintain their profitability.

Overall, the results provide evidence that regulations set forth by the central bank as a consequence of the 1997/1998 Asian financial do shape the profitability of Malaysian commercial banks. While this study provides some insights of the NSFR, implications of the new liquidity frameworks proposed by BASEL III warrant further research.

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