

Staff Paper No. 87

**GAUGING THE MACROECONOMIC IMPACT OF
BASEL III ON MALAYSIA**

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Abstract

This study gives a preliminary assessment of the macroeconomic impact of implementing Basel III in Malaysia. This is also an attempt to contribute to the increasing studies for emerging economies, especially focusing on SEACEN members. The Basel III standards seek to significantly increase the quality and required level of banks' capital. Hence, it is expected to strengthen banks' capacity to absorb risks and reduce the probability of future banking crises. Nevertheless, different strategies adopted by banks to meet the new rules—such as increasing lending rates—can impact negatively on the economy.

This study uses the structural model to assess the benefits and costs of implementing Basel III. The benefit is estimated using the expected default probability of banks while the cost is estimated from the impact of higher capital requirement on GDP. Results suggest that the benefits still outweigh the costs. The estimated net effect of Basel III implementation in Malaysia is positive, albeit modest.

GAUGING THE MACROECONOMIC IMPACT OF BASEL III ON MALAYSIA

1. Introduction

The Global Financial Crisis (GFC) triggered a large body of literature to detect its multiple determinants and channels of contagion. The common consensus among economists is that the GFC is rooted in a combination of factors, some common to previous financial crises and others, entirely new. One common factor often cited was that the easy credit conditions prior to 2008 encouraged significant high risk lending and borrowing. The substantial savings available for investments from high growth developing nations precipitated the growth in borrowing and lending activity. On the other hand, the development of innovative and complex financial products that enabled market participants to circumvent regulations was a new factor cited that exacerbated the GFC.

The forefront of efforts to decipher the GFC and to measure the assortment of the risks inherent in the global financial architecture was instigated by the G20, which established the Financial Stability Board (FSB) in April 2009. Following its creation, the Basel Committee on Banking Supervision (BCBS) and the FSB joined together in drafting the Basel III Standards.

The newly created body called the FSB is designed to provide a formal setting where governments can compare policy experiences, identify good practices and coordinate domestic and international policies. One of its key collaboration with BIS is the drafting of the final version of Basel III Standards which was released in December 2010.² The deliberations were completed at the close of 2010, but the rulings will be implemented between 2013 and 2019.

2. Three consultative documents were circulated soliciting comments throughout 2010: Strengthening the Resilience of Banking System, International Framework for Liquidity Risk Measurement, Standards, Monitoring and Principles for Enhancing Corporate Governance.

As expected, the global banking industry sounded alarms that the capital requirements of the Basel III Standards will create an earnings shortfall and drive up the cost of securitization and structured financing. In fact, the International Institute of Finance (IIF)³ contends that the implementation of Basel III would cut economic growth over the next five years in the United States, the Euro Zone and Japan by 3 percent (IIF, 2011). On the other hand, the Quantitative Impact Study (QIS) conducted by the Bank for International Settlements (BIS) demonstrates that after the implementation of the strengthened capital requirements, annual growth rates will only fall by 0.03 percent for 32 quarters (BIS, 2010b). In other words, at the end of the eight year implementation period, GDP is expected to fall by only 0.24 percentage points below its baseline level. Therefore, due to the banking sector's reinforced capital and the decline in the incidence of financial crises, the global economy will enjoy an annual growth of 0.03 percentage points above the baseline scenario (BIS, 2010a).

The varying estimates have triggered further studies focusing on the specific case of each country. For instance, Slovik and Cournède (2011) found that over a five-year implementation period, a 1 percentage point increase in capital ratios will reduce GDP relative to baseline by 0.19 percent in the United States, 0.30 percent in the Euro area and 0.11 percent in Japan. Similarly, Locarno (2011) found that for each percentage point increase in the capital ratio implemented over an eight-year horizon in Italy, the level of GDP would decline by a maximum of 0.33 percent. Likewise, Sy (2011) found that output in France will decline by a maximum of 0.30 percent relative to baseline.

The consistent message from the previous studies is that higher capital and liquidity standards have both benefits and costs. Benefits come in the form of reduced crisis probability and output loss or variability, while costs come in the form of reduced GDP relative to baseline. The common caveat is that the actual benefits and costs

3. IIF is an informal global institution comprising more than 400 of the largest banks, insurance companies, and investment firms. It provides a forum of dialogue connecting policy makers, regulators and financial institutions.

could be different from the estimates as the results are sensitive to technical assumptions, including the model choice. In addition, the net impact will depend not only on the initial conditions of capital and liquidity, but on other conditioning variables used to estimate the models. Moreover, the difference in prevailing economic conditions across countries will add uncertainties in the cost and benefit calculation. Nevertheless, regardless of the assumptions, models and results, the majority of the studies argue that costs are still outweighed by benefits as the former will tend to be temporary while the latter are most likely to be permanent.

From the previous literature, it seems there are few studies that focus on the impact of Basel III on emerging economies. This is an attempt to contribute to the increasing studies for emerging economies, especially focusing on SEACEN members. More importantly, it will try to answer important questions on the applicability of Basel III to SEACEN member economies such as (i) Are the Basel III overriding rulings absolutely necessary for emerging economies such as Malaysia which have already undergone all-inclusive banking reforms?; (ii) Are Basel III standards indispensable for economies whose banking sector is adequately capitalised.⁴

2. Data and Methodology

2.1 Panel Least Square (Benefit Model)

To assess the macroeconomic impact of higher capital requirements of Basel III, we estimate a panel least squares model as suggested by Basel's Macro Assessment Group (BIS, 2010a). Banks' balance sheets and income statements were gathered to obtain the required bank-level data for this first approach. These were obtained using the Bankscope⁵ database. The satellite model approach likewise

4. Based on SEACEN's survey for the Deputy Governors' Supervision Meeting held in Cambodia on August 2012, 11 member economies including Malaysia is well above the minimum 8% CAR (Capital Adequacy Ratio) set by Basel standards.

5. Bankscope is owned by Fitch Rating Agency Corporation.

requires the use of individual bank's credit ratings which were transformed into numerical expected default frequencies to compute for the benefit analysis.

The assessment of the net impact of Basel III using banks' balance sheets involves estimating the *cost* of higher capital that is related to adjustments that banks need to make during the transition period. In this panel least square analysis, we model the possible avenues that banks would undertake to meet higher capital requirements set by regulators. Banks are likely to meet higher capital requirements through a combination of issuance of new shares, increased accumulation of retained earnings (reduced dividend payouts and/or increased spreads of lending rates over funding costs) and reduced loans. The key elements of balance sheets considered in the analysis are: net income, return on assets, return on equity, risk-weighted assets, net loans, net charge-offs, total assets, and total capital. The *benefit* of higher capital requirement through reduced crisis probability is estimated using:

$$EDF_t^i = \alpha_i + \sum_{k=1}^p \theta_k^{INC} \cdot INC_{t-k}^i + \sum_{k=1}^q \theta_k^{RISK} \cdot RISK_{t-k}^i + \sum_{k=1}^r \phi_k^X \cdot RISK_{t-k}^i \cdot X_{t-k}^i \quad \text{Equation 1}$$

Where EDF = expected default frequency of bank i at time t ; INC = indicators referring to bank's income capacity (net income, return on equity (ROE) and return on assets (ROA)), $RISK$ = indicators of risk from bank's balance sheet (risk weighted assets, net loans, loan write offs), and X = structural indicators representing size (size = total assets) and capital (capital = total capital).

The crisis probability is measured on the basis of individual bank's expected default frequency transformed using individual bank's credit rating. In this step, the crisis risk is specified as a function of a vector of bank-specific characteristics. Two broad categories of factors are expected to influence crisis risk: a set of variables referring to the bank's capacity to generate income and accumulate capital and a set of variables referring to the bank's level of risk in the balance sheet.

The interaction term between *RISK* and *X* makes it possible to analyse how the relationship between the perceived risk and bank characteristics changes with the size of the institution and its degree of capitalisation.

2.2 Vector Autoregression (Cost Model)⁶

Another approach is to use an unrestricted VAR to estimate the impact on GDP of higher capital requirements. As suggested by BIS (2010a), we use measures of bank capital, lending wedge⁷, aggregate bank loans to consumers and firms and economic output (real GDP). The first three are bank-level data, while the last is country-level data.

The use of VAR considers how a unit change in capital may affect variables of concern. Similar to BIS (2010a), we assume that higher capital funding costs are fully passed on to lending rates, which increases the lending wedge.⁸ As a result, firms and consumers may decrease their demand for loans, lowering debt-financed investment and consumption, which eventually will lead to lower GDP growth. Thus, changes in bank capital will have an impact on real GDP growth by changing the lending wedge and/or total loan portfolio of banks. Nevertheless, the loan portfolio of banks may increase as a result of bank's efforts to comply with higher capital requirements since higher

6. The VAR model was used to estimate the cost since the panel least square model produced less stable and less reliable estimates. Moreover, our VAR model revealed only short-run relationships. Nevertheless, we report the results of this approach with this caveat in mind.

7. The lending wedge is the difference between borrowing and lending rates for each bank. The borrowing rates can be approximated by dividing total interest on deposits to total deposits. The lending rates are approximated by dividing total interest on loans to total loans. All data are provided by Bankscope and individual bank ratings are taken from RAM's ratings which are wholly owned by RAM Holdings Berhad.

8. BIS (2010a) mentions that in practice, banks may follow a combination of strategies to comply with higher capital requirements which could include an increase in lending rates, decrease in loan portfolio and decrease in dividend payouts.

lending allows banks to earn higher interest income and accumulate retained earnings.

The following VAR model of order p is used:

$$\Delta Y_t = c + \sum A_p \Delta Y_{t-p} + V_t \quad \text{Equation 2}$$

Where Y_t is an $n \times 1$ vector of endogenous variables, A_p is a matrix of coefficients to be estimated, c is the intercept vector of the VAR, and V_t is a generalisation of a white noise process.

The vector of endogenous variables includes capital, lending wedge, loan portfolio and real GDP. VAR ordering is capital, lending wedge, loan portfolio and real GDP. Since our interest is to investigate the impact of an increase in capital to the macroeconomy, capital is placed on top of the VAR ordering, followed by lending wedge and loan portfolio. Real GDP is placed last in the ordering to allow capital to have the maximum opportunity to affect it through several channels.

According to BIS (2010a), an advantage of using this approach is that many factors that need to be modelled separately by other estimation process – including international spillover and the role of monetary policy – are implicitly incorporated. However, since statistical relationships are estimated from historical data, they may not be fully informative about how economic actors will respond to future policy changes (the Lucas critique).

3. Benefit and Cost Impact of Basel III to Malaysia

In quantifying the benefits of Basel III, the coefficient of the sum of income and risk indicators as specified in equation 1, 4 percent, is multiplied by the cost of crisis, which is assumed to be 19 percent.⁹ This produces an increase in GDP of 0.76 percent. The VAR equation is used to quantify the costs of Basel III. Table 1 shows the accumulated response of variables of interest to a 1 percent change

9. We used 19 percent output loss assumption by the Macroeconomic Assessment Group-Bank for International Settlements (BIS, 2010a).

in capital.¹⁰

Based on our model results, the lending wedge increased in

Table 1
Accumulated Responses of Lending Wedge, Loan Portfolio
and Real GDP to a Unit Change in Capital Requirement
(in Percent)

Period	Lending Wedge	Loan Portfolio	Real GDP
Yearly	0.27	2.51	-0.46

response to the increase in capital, implying that banks may initially respond to the higher capital requirements by increasing their lending rates which may have an initial negative impact on the economy similar to results of other studies. This means firms and consumers may decrease their demand for loans, lowering debt-financed investment and consumption which eventually lead to lower GDP growth.

Results show that for Malaysia, higher capital requirements may have a negative impact on real GDP upon its implementation. Nevertheless, this may be offset by the benefit of strengthening banks, making them better prepared for financial crises and mitigating the output losses associated with them. The increased resiliency of banks as a result of higher capital may eventually have a positive impact on economic growth. If the actual impact is contrary to predicted and the negative impact is significant and prolonged, then appropriate

10. We divided the shocked variable (capital) by its own standard deviation and expressed it in percent to obtain a 1 percent change. Responses of all the other variables were likewise divided by the standard deviation of the shocked variable to normalise the responses.

monetary policy may be used to dampen any contraction impact of the reforms. For instance, monetary easing could offset the probable negative impact of the increase in the lending wedge. Table 2 summarises the estimated benefit, cost and net impact on GDP of meeting Basel III requirements.

In contrast to studies that cover advanced and developed countries

Table 2
Benefit and Cost Impact of Basel III in Malaysia
(in Percent)

Benefit	Cost	Net Increase to GDP
0.76	-0.46	0.30

(see Table 3), the impact of Basel III to Malaysia is relatively small and positive. This may be due to the fact that the Malaysian banking system is well-capitalised as noted earlier. However, similar to the Philippine study, the effect of Basel III is positive. Based on SEACEN's latest survey, Malaysia's actual Capital Adequacy Ratio (CAR) is 14.70 percent compared to the 10.5 percent proposed in Basel III. Moreover, Malaysia's Actual Tier 1 ratio is 12.90 percent compared to 8.5 percent in Basel III. This implies that the balance sheet adjustment of Malaysian banks may not be sizeable in order to meet the new regulations.

As a caveat, BIS (2010a) mentions that estimated impact of Basel

Table 3
Basel III Impact on Other Countries¹¹

Countries Covered	Author	Impact of a one percentage point increase in capital requirement on GDP during Basel III implementation period	Estimation Model
United States, Euro Area, Japan	Slovik and Courmède (2011)	Decrease in GDP by 0.20%	DSGE
Italy	Locarno (2011)	Decrease in GDP by 0.33%	Structural
United States	Angelini et al. (2011)	Decrease in GDP by 0.09%	DSGE
United States, Euro Area, Japan, UK and Switzerland	Institute of International Finance (2011)	Decrease in GDP by 3.2%	Not Available
France	Sy (2011)	Decrease in GDP by 0.30%	Not Available
Philippines	Santos and Bernabe (2012)	Increase in GDP by 0.01%	Structural (panel least square, VAR)

11. BIS (2010a) provides several possible methods to quantify the impact of Basel III on the economy. First is through the use of a satellite model (panel least square). In this approach, the impact of changes to regulatory requirements are modeled by considering the adjustments that banks make to their balance sheets to achieve a particular capital ratio. The model assumes that banks target a desired capital ratio that is based on their regulatory requirements as well as other bank-specific factors, and that banks adjust both the level of capital and risk-weighted assets over time to achieve this desired capital ratio. A key element of this methodology is the need for detailed bank level data. Another is through the use of bank-augmented DSGE models. An advantage of this method is that dynamic relationships among different macroeconomic variables can be captured while being grounded in microeconomic theory. Nevertheless, DSGE models may be too stylised to fully capture the dynamics of the data. Moreover, fitting DSGE models to observable data and solving them may be challenging, even when using sophisticated econometric and statistical methods. Third is the use of past statistical relationships among capital, growth and other variables to estimate the likely growth effects of tighter capital and liquidity regulation, through the use of reduced-form VAR models. An advantage of this approach is that VARs do not rely on detailed ex-ante modeling of the relationships among the variables of interest. However, a disadvantage of VARs is that the results are heavily influenced by the market and macroeconomic conditions in place at the time of large past shifts in the modeled variables, so they may not be informative if similar shifts take place under different circumstances.

III may differ from actual results since there may be factors not captured by the models used. For instance, international spillover effects can aggravate the negative impact since banks that lend across-borders also need to comply with Basel III requirements. The possibility that monetary policy may be used to dampen any contractionary impact of the reforms on the macroeconomy was likewise not considered.

4. Conclusion

In the introduction section of this study, we interpose the question whether Basel III standards is indispensable to emerging economies particularly Malaysia where the banking system is adequately well capitalised. The empirical results show that the answer to the question is affirmative. Judging from the net positive impact of Basel III on Malaysian GDP, solidarity on a global uniform framework will not only bring domestic financial stability but more importantly boost domestic economic growth.

The study also exemplifies a vivid testimony that the growing resilience of emerging economies is derived from the early introduction of banking sector reforms brought about by past crises which has undoubtedly allowed them to better weather the GFC.

Lastly, it is also worthy to note that due to the highly interlocked global financial system, reforms introduced at the global level must be unanimously enforced by all jurisdictions to ensure the mitigation, if not avoidance, of future crises. It is also worth mentioning that while we are moving towards the same direction, it will take different routes for different economies to reach it. Hence, while global reforms apply to all interconnected economies, domestic policies need to be designed in accordance with the depth and the degree of integration with the global financial sector.

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