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Abstract

The purpose of this study is to better understand the likely impact on Asian economies and financial institutions of various recent global financial reforms, including Basel III capital adequacy and liquidity rules. Part one reviews the lessons of the global financial crisis (GFC) of 2007–09 and their relevance for Asian economies. Part two describes the major regulatory reforms that have been announced and possible concerns about their impacts on emerging economies. Part three reviews the literature aimed at quantifying the impacts of Basel III capital adequacy rules. Part four develops our methodology and analysis of the quantitative impact of Basel III capital adequacy rules on a panel of Southeast Asian financial institutions with emphasis on the effect on economic growth. Finally, the study concludes with a discussion on the policy implications of the results obtained from the previous section for Asian financial sectors and economies. Overall, we find that the Basel III capital adequacy rules are likely to have limited impacts on economic growth in Asia, but other financial regulations, including liquidity standards and rules for over-the-counter (OTC) derivatives, could have stunting effects on financial development in the region.

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1. INTRODUCTION

With a few notable exceptions, central bankers, financial supervisors/regulators, other policymakers, international organizations, the private sector, and academic economists failed to predict the global financial crisis (GFC) of 2007–08 and underestimated its severity. Such a dramatic failure of the entire financial community led to much soul searching by academics, regulators, and governments, and gave birth to a whole host of regulatory innovations. These innovations generally were sponsored under the aegis of the Group of Twenty (G20) process, especially the Basel III new rules for capital adequacy, liquidity, supervision, and regulation of systemically important financial institutions (SIFIs), rules for shadow banking, derivatives trading, etc. Largely in line with the G20 guidelines, new national-level rules emerged as well, including Dodd-Frank in the United States (US), the Vickers Commission Report in the United Kingdom (UK) and various initiatives enacted by the European Union.

It is broadly expected that these reforms will bring about substantial benefits by reducing the risk of financial crises, enhancing the resilience of banks and other financial institutions in case crises do arise, reducing economic volatility, and increasing transparency. However, these benefits will necessarily come with some costs in terms of greater regulatory burdens, higher transactions costs, slower credit growth, and reduced innovation in the financial sector. These may have impacts on real economic growth as well. A number of studies have examined the potential impacts of these regulations on growth, but they have focused mainly on impacts in advanced economies. This is natural, since the regulations themselves were responses to conditions in advanced economies that led to the crisis. Also, advanced economies generally dictated the development of new financial regulations under the G20 process—emerging economy members were largely bystanders in this process.

However, the new regulations will also apply to emerging economies, including those in Asia, even though those economies did not experience financial crises, and have financial systems considerably different from those in advanced economies. Asian economies were largely unaffected by the direct financial impacts of the crisis, since they held relatively little in the way of toxic financial assets, generally had less “sophisticated” financial systems and stricter regulation, and had strong balance sheets, in no little part in response to the trials of the Asian financial crisis a decade earlier. Also, supervision and regulation were more interventionist in those economies. Finally, the need for tighter financial regulation and supervision must be balanced with needs for financial development, deepening, and integration, as well as financial inclusion, to support sustainable growth in the region

There have been persistent concerns that the G20-sponsored new financial regulations could have potentially negative impacts on the growth prospects of emerging economies, including those in Asia. Although Asian financial institutions generally are well capitalized, rapid growth prospects in the region imply the need to raise large amounts of capital in coming years to sustain this growth, while maintaining the rising capital ratios mandated by the Basel III rules. Rules restricting the trading of derivative products could also stunt the development of Asian financial markets by diverting such trading to platforms in advanced economies, and could raise the costs of foreign-currency fund raising and trade finance. New liquidity rules could be a constraining factor when local financial markets are still under-developed. A number of studies have attempted to estimate the possible impacts of such rules on lending activity and economic growth, and some widely varying estimates have emerged. This study will review the earlier evidence, and provide some fresh estimates relevant for Asian

economies. This study also contributes to the much smaller literature on the impacts of the new financial regulations on Asian economies.

The paper is organized as follows. In Section 2 we review the lessons from the GFC that formed the basis for new regulations. In Section 3, we summarize the major regulatory innovations and their potential impacts on Asian economies. Section 4 reviews the literature on estimates of the effects of the new regulations. Section 5 provides new estimates of the impacts of capital adequacy rules on growth in a number of Asian economies. Section 6 concludes with messages and implications.

2. LESSONS OF THE GLOBAL FINANCIAL CRISIS

The root cause of the GFC of 2007–09 traces back to the buildup of excessive optimism—created by a long period of world-wide high economic growth, low real interest rates, and subdued volatility of financial prices—as well as the flood of liquidity, i.e., what was termed "the Great Moderation." In these benign macroeconomic and financial environments, investors around the world were prompted to search for yield and underestimated the risks of investment, especially those in new financial products. From this perspective, the International Monetary Fund (IMF) (2009a) summarized causes of the GFC in three dimensions: flaws in financial regulation and supervision; failure of monetary policy to address the buildup of systemic risk; and a weak global financial architecture.

2.1 Failure of Monetary Policy to Contain Financial Imbalances

The IMF's analysis pointed to "macroeconomic policies, which did not take into account building systemic risks"[1] and states that, "a key failure during the boom was the inability to spot the big picture threat of a growing asset price bubble." Clearly, the US Federal Reserve underestimated the buildup of financial imbalances coming from housing price bubbles, high leverage of financial institutions, and interconnections between financial markets. The Federal Reserve may well have assumed that even if the asset price boom collapsed, the impacts on the financial system and the economy could be mitigated by lower interest rates.[2]

This factor was the basis for the debate between John Taylor (Taylor 2009) and US Federal Reserve (Fed) Chairman Ben Bernanke (Bernanke 2010) about the appropriateness of the Fed's monetary stance in the period 2002–06. Moreover, the Fed was inclined not to lean against emerging asset bubbles, as it believed that such bubbles were difficult to identify, and that it could move swiftly to clean up the damage afterward.

In theory, tighter prudential regulation could have been mobilized to contain systemic risk, but in practice, before the authorities realized it, huge systemic risks had accumulated below the regulators' radar, in the shadow banking system. Given the failure of prudential supervisory action to prevent a buildup of systemic risk, the central bank, as a macro-supervisor, should have reacted to credit booms, rising leverage,

[1] IMF (2009b).

[2] Wessel (2009) provided a well-documented and insightful account of the thinking of US policymakers during the crisis. The inescapable conclusion is that for a long time after the start of the crisis, central bankers—Bernanke, King, Trichet, and their colleagues—did not see the crisis coming and for too long ignored the advice of those who did.

sharp asset price increases, and the buildup of systemic vulnerabilities by adopting tighter monetary policy.

2.2 Flaws in Financial Regulation and Supervision

Several excellent reviews of what went wrong in financial regulation (Group of Thirty 2009; Brunnermeier et al. 2009; De Larosiere Group 2009) point to the fact that there were regulatory and supervisory deficiencies, including inadequate macroprudential supervision. Essentially, national financial regulators and supervisors failed to see the large buildup of systemic risks. In the US, the regulatory and supervisory framework was highly fragmented and its scope was narrowly focused on insured deposit-taking institutions and did not cover all financial activities that posed economy-wide risks. As a result, the "shadow banking" system grew among investment banks, mortgage-brokers and originators, special investment vehicles, insurance companies, and other private asset pools, as they had long been lightly regulated by a patchwork of agencies and generally not supervised prudentially.[3]

Due to the propensity to focus on individual institutions, supervisors around the world failed to recognize interconnections and links across financial firms, sectors, and markets due to the lack of a macroprudential approach. Supervisors only focused on their own piece of the puzzle, overlooking the larger problem. Shin (2009) pointed out a fallacy of aggregation: "mis-educated" supervisors and examiners were focused on individual institutions, without regard to the impact on the system. Thus there is a growing realization that a macroprudential approach to supervision and an effective systemic stability regulator are needed to complement microprudential measures.

2.3 Weak Global Financial Architecture

There were deficiencies in the global financial architecture—the official structure that facilitates global financial stability and the smooth flow of goods, services, and capital across countries. There are three issues.

First, global institutions—like the International Monetary Fund (IMF), the Bank for International Settlements (BIS), and the Financial Stability Forum (now the Financial Stability Board [FSB])—failed to conduct effective macroeconomic and financial surveillance of systemically important economies, that is, they did not clearly identify the emerging systemic risk in the US, the UK, and the euro area, send clear warnings to policymakers, or provide practical policy advice on concrete measures to reduce the systemic risk.[4] Their analysis clearly underestimated the looming risk in the shadow banking system, interconnections across financial institutions, markets, and countries, and global macroeconomic-financial links.

[3] Tobias and Shin (2008) estimate that the "shadow banking" system was as large as US$10.5 trillion, comprising US$4 trillion assets of the large investment banks, $2.5 trillion in overnight repos, US$2.2 trillion in structured investment vehicles, and another US$1.8 trillion in hedge fund assets. This should be compared with US$10 trillion in assets held in the conventional US banking system, which meant that system leverage was at least double what was reported.

[4] The IMF (2009a) admitted that "official warnings both within and outside the Fund were insufficiently specific, detailed, or dire to gain traction with policymakers." IMF surveillance often echoed the conventional view that advanced countries—such as the US and the UK—with relatively low stable inflation together with profitable and well-capitalized banking sectors could withstand the unwinding of the bubble in housing and capital markets.

Second, the crisis revealed the ineffectiveness of fragmented international arrangements for regulation, supervision, and resolution of internationally active financial institutions. The problem became particularly acute when such institutions showed signs of failing. Although home country authorities are mainly responsible for resolving insolvent institutions, host-country authorities were often quick to ring-fence assets in their jurisdictions because of the absence of clear international rules governing burden sharing mechanisms for losses due to failure of financial firms with cross-border operations.

2.4 Global Imbalances

The view is widespread, although controversial, that the global payments imbalance contributed to the GFC by fostering international capital flows from the surplus to deficit countries, which depressed global long-term interest rates, and thereby led to the development of asset price bubbles around the world, most notably in the US housing market. This capital movement fueled the "global savings glut" identified in Bernanke (2005) as the possible answer to the "conundrum" described by his predecessor Alan Greenspan (Greenspan 2005), i.e., the apparent decoupling of short-term and long-term US interest rates during the period 2002–05.

We are somewhat skeptical about this view. To be sure, the accumulation of large-scale foreign exchange reserves by several Asian and other economies may have contributed to low long-term interest rates in the US and elsewhere. However, we believe that the main responsibility for the development of housing price bubbles and excessive financial risk-taking rests with the relevant domestic monetary and financial sector authorities. There is ample evidence of a wide range of policy and regulatory failures in the US and elsewhere. Perhaps the most persuasive piece of evidence is that Canada—which faced long-term interest rates very similar to those of the US during the past decade and bigger increases in housing prices—managed to avoid a financial crisis, mainly as a result of much more prudent financial sector regulation that limited the buildup of leverage.

2.5 Asian Strengths and Weaknesses

When assessing the appropriateness and potential impact of post-GFC regulatory innovations on Asian financial institutions, it is important to view them from the perspective of the strengths and weaknesses of Asian financial systems. First, perhaps the most obvious point is that Asian financial systems emerged relatively unscathed from the GFC and the euro area sovereign debt and banking sector crisis. This reflected a combination of factors, including sound balance sheets in both private and public sectors, prudent risk management, and modest exposure to toxic assets. Large foreign exchange reserves provided a cushion against volatile capital flows in most cases, although such accumulation probably contributed to international current account imbalances. Also, Asian regulatory frameworks were more "conservative," with less regulatory capture and less ideology about virtues of free financial markets. Moreover, Asian regulators already had many macroprudential policies (loan-to-value ratios, administrative guidance to limit bank-credit growth, real estate loan caps, etc.) and, critically, were willing to use them.

Weaknesses include the fact that Asian financial systems are still dominated by bank lending, with relatively smaller bond markets and modest roles for securitization, derivative products, etc., which makes them more vulnerable to a banking crisis. Low degrees of regional financial integration in portfolio investment keeps Asian financial

markets dependent on advanced economy markets such as London and New York. Limited regulatory capacity makes it difficult to address problem areas such as procyclicality, exposure to activities of large global financial firms, growing non-bank financial activities, and rising financial complexity over time. Shortfalls in governance and accounting standards, etc., also limit the ability of regulators to supervise and regulate financial markets. Finally, Asian economies tend to be vulnerable to volatile capital flows and risks of "double mismatches" (currency and interest-rate mismatch), although the latter has declined significantly since the Asian financial crisis.

3. MAJOR GLOBAL AND REGIONAL REGULATORY INITIATIVES AND POSSIBLE ASIA IMPACTS

This section describes the major innovations in financial regulation developed following the GFC under the auspices of the G20, and their possible implications for Asian emerging economies. A number of G20 financial regulatory issues have already been finalized, including:

- Requirements for greater quantity and quality of capital;
- Liquidity requirements;
- Leverage ratio;
- Standards for OTC derivatives markets;
- Identification, surveillance, regulation, and resolution of systemically important financial institutions (SIFIs), especially global ones (G-SIFIs); and
- Compensation guidelines.

Others are still being debated, including:

- Strengthened oversight of shadow banking;
- Credit rating agencies;
- Development of macroprudential frameworks and tools;
- Convergence to strengthened international accounting standards; and
- Strengthened adherence to international supervisory and regulatory standards.

3.1 Basel III Regulations

Capital Requirements

The new Basel III rules for capital adequacy aimed to strengthen both the quantity and quality of banks' capital to improve banks' ability to survive a crisis. The quantity requirements are summarized in Table 1. The main innovations are mandated increases in the minimum common equity capital ratio from 2% to 4.5% and the minimum Tier 1 capital ratio from 4% to 6% by January 2015, and the introduction of a "capital conservation buffer" in 2016 that will rise to 2.5% by 2019 to increase the ability

to withstand periods of high stress.[5] The quality aspect includes mainly gradually phasing out some less liquid assets from the definition of Tier 1 capital, including deferred tax assets (DTAs), mortgage servicing rights (MRS), and shares of financial institutions. Capital instruments that no longer qualify as non-common equity Tier 1 capital or Tier 2 capital will be phased out over a 10 year horizon beginning 1 January 2013, and Tier 3 capital is eliminated altogether.

Table 1: Basel III Capital Adequacy Requirements Schedule

Phase-in Arrangements (shading indicates transition periods) (all dates are as of 1 January)

	2013	2014	2015	2016	2017	2018	2019
Leverage Ratio	Parallel run 1 Jan. 2013–1 Jan. 2017					Migration to Pillar 1	
Minimum Common Equity Capital Ratio	3.5%	4.0%	4.5%	4.5%	4.5%	4.5%	4.5%
Capital Conservation Buffer				0.625%	1.25%	1.875%	2.50%
Minimum Common Equity Plus Capital Conservation Buffer	3.5%	4.0%	4.5%	5.125%	5.750%	6.375%	7.0%
Phase-in of deductions from CET1 (including amounts exceeding the limit for DTAs, MSRs and financials)		20%	40%	60%	80%	100%	100%
Minimum Tier 1 Capital	4.5%	5.5%	6.0%	6.0%	6.0%	6.0%	6.0%
Minimum Total Capital	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%
Minimum Total Capital Plus Conservation Buffer	8.0%	8.0%	8.0%	8.625%	9.125%	9.875%	10.5%
Capital Instruments that no longer qualify as non-core Tier 1 capital or Tier 2 capital	Phased out over 10 year horizon beginning 2013						

Source: BCBS (2010a).

The rules also put a floor under the buildup of leverage in the banking sector by requiring that the ratio of capital to (un-weighted) assets be at least 3%. Also, there are plans to introduce additional safeguards against model risk and measurement error by supplementing the risk-weighted assets measure with a simpler measure that is based on gross exposures.

Other measures related to capital requirements include: strengthening capital requirements for counterparty credit exposures arising from banks' derivatives, repo, and securities financing transactions; raising the capital buffers backing these exposures; providing additional incentives to move OTC derivative contracts to central counterparties (mainly clearing houses); and, providing incentives to strengthen the risk management of counterparty credit exposures.

A number of potential problems for Asian economies from the higher capital rules have been identified. First, higher capital ratios may restrict growth of lending and economic output. This is one of the most commonly cited issues, and the literature on this subject will be reviewed in the next section. Second, the 100% credit conversion factor (CCF) applied to off-balance sheet items (including trade finance exposures) for Basel III leverage ratio purposes will increase the cost of and reduce the demand for trade

[5] The definition of periods of "high stress" has not yet been made, and is controversial. See discussion below.

finance, and trade finance is a critical factor for supporting trade growth in Asian economies. The credit-to-gross domestic product (GDP) guide for activating the Basel III countercyclical capital buffer may be too mechanistic for emerging market economies (EMEs) which are undergoing significant financial development. The capital rules may constrain the ability to issue convertible bonds in EMEs. Finally, triggers for debt-to-equity conversions may differ between home and host country, leading to confusion in a crisis situation. See FSB (2012) for a discussion of these issues.

For EMEs, the new definition of capital is not expected to represent significant change in practice. In these economies, there are few alternatives to equity; common equity has always been the major component of capital (IMF Global Financial Stability Report [GFSR] 2012). Table 2 shows data on major capital ratios for Asian banks—the first three columns are unweighted averages from the BankScope database, while the last column is IMF data. Table 2 shows that Asian banks are generally well-capitalized, with overall capital adequacy levels in most cases well above the 10.5% target for 2019. (Hong Kong, China's ratios from the BankScope data look low, but seems to be distorted by use of an unweighted average.) This suggests that capital adequacy rules per se do not pose a significant problem for sustaining credit growth in the near term. Asian non-performing loan (NPL) ratios are also generally low, reflecting the passage of time since the Asian financial crisis. However, as described in Section 4 below, the new rules could prompt Asian banks to raise capital ratios to maintain a safe margin above the minimum requirements, which could have negative impacts on loan growth.

Table 2: Asia Banking Sector Capital Ratios, 2011

Economy	Tangible Common Equity/Tangible Assets, %	Tier 1 Capital/Risk-weighted Assets, %	Total Regulatory Capital/Risk-weighted Assets, %	Total Regulatory Capital/Risk-weighted Assets, % (IMF)
PRC	6.0	9.7	12.2	12.7
Hong Kong, China	6.5	4.7	5.9	15.8
India	11.6	19.0	26.1	13.1
Indonesia	20.3	14.9	18.7	16.1
Japan	4.1	15.0	17.9	14.2
Republic of Korea	9.0	10.5	13.8	14.0
Malaysia	6.7	11.5	15.3	17.7
Philippines	10.3	14.8	17.9	17.1
Singapore	6.9	15.7	18.2	16.0
Taipei,China	6.1	10.5	16.2	11.9
Thailand	8.7	8.0	10.2	12.3

IMF = International Monetary Fund; PRC = People's Republic of China.

Source: Bankscope, accessed 20.02.2013, IMF Financial Soundness Indicators, available at: http://fsi.imf.org/, accessed 13 February 2013.

3.2 Liquidity Rules

The original December 2010 proposal for Basel III (BCBS 2010a) outlined two new ratios that financial institutions would be subject to:

- A liquidity coverage ratio (LCR): the ratio of a bank's high quality liquid assets (i.e., cash, government securities, etc.) to its net cash outflows over a 30-day

time period (i.e., outflows in retail deposits, wholesale funding, etc.) during a severe system wide shock. This ratio should exceed 100%.

- A net stable funding ratio (NSFR): the ratio of the bank's available amount of stable funding (i.e., its capital, longer-term liabilities and stable short-term deposits) over its required amount of stable funding (i.e., value of assets held multiplied by a factor representing the asset's liquidity). This ratio should exceed 100%.

The proposed phase-in period is shown in Table 3.

Table 3: Liquidity-related Rules

Phase-in Arrangements (shading indicates transition periods) (all dates are as of 1 January)

	2011	2012	2013	2014	2015	2016	2017	2018
Liquidity coverage ratio	Observation period begins				Introduce minimum standard			
Net stable funding ratio		Observation period begins						Introduce minimum standard

Source: BCBS (2010a).

Including liquidity risk in Basel III should be regarded as a step forward. The LCR and NSFR liquidity adequacy standards can be seen as reasonable approaches towards the regulation of liquidity risk. For example, the focus of the LCR on system-wide stress scenarios is the appropriate way to analyze the systemic consequences of holding less liquid assets and/or funding those assets with short-term liabilities (Acharya 2012).

A number of potential issues of the liquidity standards for emerging economies have been identified. First, the scarcity of high quality liquid assets (HQLA) in EMEs may inhibit local capital raising and constrain liquidity in local markets. This is despite the fact that LCR was revised to ease its impact by widening HQLA to include certain equities and securitization products. Second, liquidity ratios may constrain bank lending in economies where bank lending is the main source of credit. Finally, the calculation of required ratios can be complex.

3.3 Other Requirements Emanating from the FSB and BCBS

A number of other new requirements originating from the FSB and the BCBS may also have potentially negative impacts on EMEs. First, policy measures for G-SIFIs may constrain their lending growth in host countries. Also, there are a number of concerns about cross-border resolution frameworks for G-SIFIs, especially when the home regulator is far distant from the host country, and has little knowledge or interest about the situation in that country.

Second, additional capital requirements and margin requirements for uncleared OTC derivatives may limit financing opportunities. For example, Basel III mandates a two-way initial margin on a gross basis for foreign currency swaps related to foreign exchange swaps related to foreign currency bond issuance and trade finance, even though such swap arrangements have little risk. This would raise the cost of these transactions and make them less attractive. Also, new rules may put domestic central clearing parties (CCPs) at a disadvantage relative to those in advanced economies.

Rules aimed at curbing shadow banking, namely those for securities lending and repos, can also have unintended consequences. These rules include minimum haircuts, cash collateral reinvestment, requirements on re-hypothecation, and minimum regulatory standards for collateral valuation and management. In many cases these are stricter than pre-Basel III rules.

3.4 Non-Basel-III Requirements

Other new financial regulations can also have significant consequences for EMEs. The US Dodd-Frank financial legislation enacted in 2010 established the "Volcker Rule" (41) that prohibits covered banking entities from engaging in proprietary trading, or acquiring or retaining an ownership interest in, or sponsoring, a hedge fund or private equity fund. To engage in permitted underwriting and market making activities, banking entities will be required to satisfy conditions that could significantly constrain their operations, including conditions based on the types of revenues that the activities generate, the scale of the activities in relation to expected near-term customer demand, and the criteria used to determine the compensation provided to individuals who conduct the activities (Skadden, Arps, Slate, Meagher & Flom LLP & Affiliates 2011).

Notably, the Volcker Rule exempts US government securities from the prohibition against proprietary trading. This clearly discriminates against other securities, and may have negative impacts on the liquidity of government, corporate securities, and derivatives markets in other countries that may hinder bank liquidity and financial market development (Baxter 2012).

Dodd-Frank also mandates that the US Commodities Future Exchange Commission (CFTC) impose extensive regulation of OTC derivatives, including centralized clearing systems, the registration of swap dealers and market participants, capital and margin requirements, and the public reporting of transactions and pricing for both cleared and uncleared swaps. Among others, the rule would impose a mandatory two-way initial margin on a gross basis, as well as minimum regulatory standards for collateral valuation and management, which would significantly raise the costs of such transactions. Significantly, these requirements would have direct extraterritorial effects in all cases except where the swap transaction is between two entities neither of which is controlled in any way by a US entity and only when the transaction takes place outside of the US. For any other transactions involving non-US counterparties, they would subject the non-US entities to double regulation (Baxter 2012).

The proposed European financial transactions tax (FTT) would impose taxes on trading of any European securities, regardless of where in the world they are traded. The tax would have very broad coverage, including all transactions on financial markets except spot currency transactions and the primary emission of shares and bonds (The Trade News 2013).

4. LITERATURE REVIEW

A number of recent research studies and reports have been undertaken by public and private sector organizations that examine the macroeconomic costs and benefits of the new Basel III capital and liquidity regulations. The cost estimates of these studies diverge widely, which can be attributed to differences in methodology, data, sample period, and coverage of banks and countries.

One notable official study is the Report of the Macroeconomic Assessment Group (MAG), one of the two[6] working groups established under the aegis of the Financial Stability Board (FSB) and the Basel Committee on Banking Supervision (BCBS) in February 2010. MAG (2010) synthesizes the outcomes of macroeconomic models from 15 countries as well as from a number of international organizations to examine the macroeconomic effects of the transition to increased capital and liquidity regulations.[7] In carrying out its assessment, MAG (2010) used different scenarios for shifts in capital and liquidity requirements over different transition periods. These different transition periods served as inputs to the broad range of models (large scale macroeconomic models, reduced-form models, and bank augmented dynamic stochastic general equilibrium [DSGE] models) used to produce the macroeconomic assessment of the transition to higher capital and liquidity standards.

MAG (2010) estimates that bringing the global common equity capital ratio to the agreed minimum plus the capital conservation buffer would result in a maximum decline in gross domestic product (GDP), relative to baseline forecasts, of 0.22%, which would occur after 35 quarters. The growth rate would be only 0.03 percentage points below the baseline over the transition period after which it would return towards its baseline growth path. In view of these results, MAG asserts that the Basel III accord would have a "relatively modest impact on growth."

In addition to the Report produced by MAG, BCBS in August 2010 also released the Report by the Long-term Economic Impact (LEI) working group (BCBS 2010b), which was the second working group jointly created by the FSB and BCBS. BCBS (2010b) focuses on the impact of higher capital and liquidity requirements assuming banks have completed the transition to the new levels of capital and liquidity regulations, and does not consider the benefits and costs associated with the transition phase. It compares two steady states, one with and one without the proposed regulatory enhancements for the same 15 countries that MAG (2010) analyzed. It found that each percentage point increase in the capital ratio causes a 0.09% decline in the level of output relative to the baseline, while meeting liquidity requirements will lead to a 0.08% decline in output.

The estimates of the two BCBS studies have been challenged by the International Institute of Finance (IIF), a private sector institution. Its own report (IIF 2011) estimates a far larger cost resulting from the Basel III rules. It found that the level of GDP for the US, euro area, Japan, the UK, and Switzerland will on average be 3.2% lower relative to the baseline scenario after five years, which translates to an output loss of 0.7% per annum, which is far higher than the MAG (2010) estimate of an output loss of 0.03% per annum. In addition, the IIF study concludes that the Basel III rules will cost 7.5 million jobs in 5 years. These results, however, assumed a far more rapid implementation of Basel III than was eventually proposed (de Ramon et al. 2012). While the IIF and BCBS studies are not strictly comparable in view of various methodological differences, the results of both studies, nonetheless, highlight that the speed of implementation of the rules can have a significant difference on the impact of the financial reforms.

Two other studies conducted by Slovik and Cournede (2011) and by Roger and Vlcek (2011) provide alternative estimates of the impact of Basel III and found results that are quite similar to the two Basel Committee on Banking Supervision (BCBS) studies

[6] The other is the Long-term Economic Impact (LEI) Group.

[7] The countries were: Australia, Brazil, Canada, the People's Republic of China, France, Germany, Italy, Japan, the Republic of Korea, Mexico, The Netherlands, Spain, Switzerland, the UK, and the US.

described above. The Organisation for Economic Co-operation and Development (OECD) study by Slovik and Cournede (2011) combined the IIF banking sector model with the OECD macroeconomic model and found that the impact of Basel III on annual GDP growth of the US, euro area, and Japan was estimated to be in the range of 0.05 to 0.15 percentage points over a five-year period. The IMF study by Roger and Vlcek (2011) used a DSGE model that includes financial frictions and a banking sector to analyze the impacts on the US and euro area. This study found that higher bank capital requirements will lead to cumulative reduction in GDP of a little over 1 percentage point in the euro area, and slightly less in the US. On the other hand, tighter liquidity requirements will lead to a cumulative reduction in GDP by 0.8% in the euro area, and by 1% in the US.

These studies on the impact of Basel III implementation are almost exclusively focused on advanced economies. Two recent studies that address the scant available evidence on the impact of Basel III implementation for emerging economies are Parcon-Santos and Bernabe (2012) for the Philippines and Bernabe and Jaffar (2013) for Malaysia. Both studies used a similar methodology (Vector Autoregression [VAR] technique) in assessing the costs of higher capital requirements under Basel III. Parcon-Santos and Bernabe (2012) found that the accumulated impact of a 1% change in capital requirement leads to a 0.01% drop in real GDP per annum in the Philippines. Bernabe and Jaffar (2013) study found that a similar 1% change in capital requirement leads to a 0.5% drop in real GDP per annum in the case of Malaysia.[8]

These studies show a wide range of estimated impacts on growth from the Basel III capital adequacy and liquidity standards (see Table 4 for a summary). As emphasized earlier, this partly reflects the wide choice of methodologies and assumptions used in the modeling work. However, it appears that the IIF results are an outlier, and almost certainly exaggerate the likely impact. This conclusion is also reached in Santos and Elliott (2012), who note that the IIF study assumes that all costs are passed through into higher lending rates without any other adjustments. The other two studies showing relatively large impacts are Roger and Vlcek (2011) and Bernabe and Jaffar (2013), while the remaining studies show relatively small impacts. Since most of the analyses concentrated on the capital adequacy ratios, it would be valuable to have further studies on the impact of liquidity requirements as well as on the effects of the other major regulatory changes.

[8] The contrast in the estimated size of the effect of a 1% change in capital requirement between the Philippine study and the Malaysian study may be due to the difference in the way the interest rate differential variable was estimated. In the Philippines study, this variable was obtained from data from individual banks (see fn. 30, p. 9 of the same study), whereas, in the Malaysian study, the variables used to estimate the interest rate differential (borrowing rates and lending rates) were estimated using a formula (see fn. 7, p. 5 of the same study). This may have introduced some additional uncertainty in the Malaysian estimates.

Table 4: Studies of Impacts of Basel III Capital Adequacy and Liquidity Standards on GDP Growth (percentage points)

				Capital Adequacy		Liquidity Standard		Combined Effect	
Study	Countries	Methodology	Definition of Impact	Average	Cumulative	Average	Cumulative	Average	Cumulative
BCBS MAG (2011)	15 OECD countries	Large scale macroeconomic models, reduced-form models and bank augmented DSGE models	Achievement of Basel III standard over time	0.03	0.22	--	--	--	--
BCBS LEI (2010)	15 OECD countries	Large scale macroeconomic models, reduced-form models and bank augmented DSGE models	One-percentage point rise in capital adequacy ratio; meeting liquidity requirements	--	0.09	--	0.08	--	--
IIF (2011)	US, euro area, Japan, UK, and Switzerland	Banking sector model	Achievement of Basel III standard over time	--	--	--	--	0.70	3.20
OECD Slovik and Cournede (2011)	US, euro area, and Japan	IIF banking sector model and OECD macroeconomic model	Achievement of Basel III standard over time	--	--	--	--	0.05-0.15	--
IMF Roger and Vlcek (2011)	US and euro area	DSGE model with financial frictions and banking sector	Achievement of Basel III standard over time	0.14	1.00	0.13	0.90	0.27	1.90
BSP Parcon-Santos and Bernabe (2011)	Philippines	Panel VAR model	One-percentage point rise in capital adequacy ratio	0.01	--	--	--	--	--
Bernabe and Jaffar (2013)	Malaysia	Panel VAR model	One-percentage point rise in capital adequacy ratio	0.46	--	--	--	--	--

GDP = gross domestic product; BCBS = Basel Committee on Banking Supervision; MAG = Macroeconomic Assessment Group; OECD = Organisation for Economic Co-operation and Development; DSGE = dynamic stochastic general equilibrium; LEI = Long-term Economic Impact; IIF = International Institute of Finance; US = United States; UK = United Kingdom; IMF = International Monetary Fund; VAR = Vector Autoregression.
Source: Authors' compilation.

5. OUR METHODOLOGY AND RESULTS

We forecast the effect of higher capital requirements under Basel III using a panel VAR methodology similar to that in Parcon-Santos and Bernabe (2012) and Bernabe and Jaffar (2013)[9]. The following panel VAR model was used to simulate the scenario of an increase in capital requirements under Basel III:

$$Y_{it} = \tau(L)Y_{it} + \varepsilon_{it}$$

where *i* = denotes an individual bank, *t* = denotes the year, $\tau(L)$ is the matrix of estimated parameters, *L* is the lag operator (the model incorporates two lags in view of the limited number of years), vector Y_{it} = (EG_t, INF_t, $RATEDIFF_t$, GL_{it}, TRC_{it}), and ε_{it} is the error term assumed to be serially uncorrelated. EG_t is real GDP growth, INF_t is the rate of inflation,(CPI), $RATEDIFF_t$ is the cost of funds, i.e., the interest differential between the average bank lending rate and the money-market/interbank rate, GL_{it} is the growth of gross loans of $bank_i$ at time *t*, and TRC_{it} is the Tier 1 regulatory capital ratio of $bank_i$ at time *t*. EG_t, INF_t, $RATEDIFF_t$ are pure time-series country-level data, while GL_{it} and TRC_{it} are bank-level data sourced from Bankscope. The model was estimated using annual data for the period of 2005–11 for Indonesia, Malaysia, the Philippines, and Thailand.[10] Our model is in line with the interpretation that there is an interaction between the economy and the banking sector.[11] Specifically, the possible transmission channel is that a rise in the capital ratio of banks can have an impact on lending by banks and on GDP.

As long as the error term ε_{it} is serially uncorrelated, pooled least squares gives a consistent estimator for the above model. The pooled least squares estimates of our panel VAR indicate that the assumption of a serially uncorrelated ε_{it} is found to be appropriate based on the estimated autocorrelation test from our VAR estimates. After our in-sample estimation, we then conduct ex-ante forecasts of the impact on real economic growth in our four Southeast Asian economies of the phase-in arrangements in Tier 1 capital + conservation buffer under the Basel III capital requirements. Specifically, ex-ante conditional forecasts were made from 2012[12] to 2019 by simulating the impact on real economic growth of higher capital requirements (Tier 1 capital + capital conservation buffer) corresponding to the phase-in arrangements under Basel III. We assume that each bank maintains a constant gap between its initial (2011) Tier 1 capital ratio and the minimum capital ratio requirement that applies each year. Our baseline results correspond to the scenario of no regulated capital changes by individual banks in each of the four Southeast Asian countries by assuming that the actual 2011 Tier-1 Regulatory Capital Ratio of individual banks remains unchanged from 2012 to 2019.

Our conditional forecasts of the impact on real economic growth of higher capital requirements under Basel III in comparison with the baseline scenario indicate on

[9] The present study estimates ex-ante conditional forecasts of real economic growth one with and one without the higher capital requirements under Basel III, while Parcon-Santos and Bernabe (2012) and Bernabe and Jaffar (2013) estimate typical impulse response estimation that traces the implied accumulated response of real GDP to a general one percent change in the capital requirement.

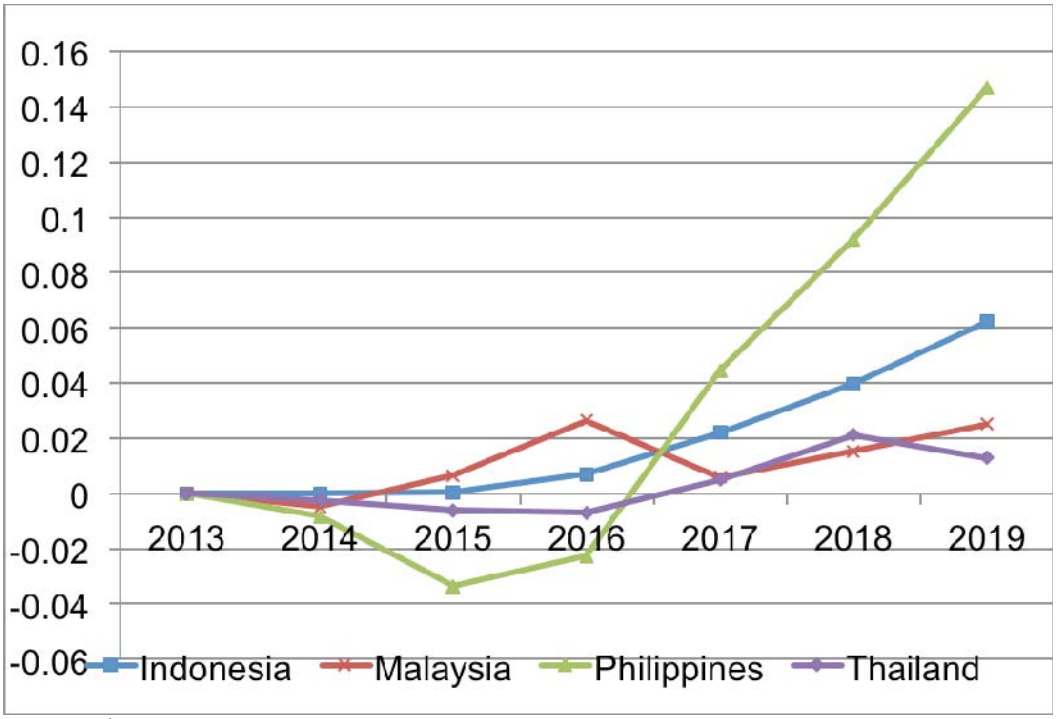
[10] Bankscope only provides annual data and at the time of writing does not yet provide the latest 2012 data for GL_{it} and TRC_{it}.

[11] See, for instance, Berben et al. (2010).

[12] The inclusion of 2012 in the ex-ante period is due to the non-availability of data in Bankscope of our bank-level variables at the time of writing of this paper.

average a rather small impact of Basel III capital adequacy rules on real economic growth of the four Southeast Asian economies (Figure 1). The specific results for the four economies are as follows:

Figure 1: Economic Growth Impact of Basel III Capital Rules: Deviation from Baseline (in %)



Source: Authors.

Indonesia: there is a minimal impact on real economic growth in the first three years of higher capital requirements and a decent recovery in economic growth thereafter;

Malaysia: there is a slight drop in real economic growth in the early years but a quick turnaround in growth in 2006. There is a slight drop in economic growth a year after the implementation of the countercyclical buffer but again a quick recovery thereafter;

Philippines: out of the four countries examined, the Philippine experiences the largest relative drop in growth in the first few years of higher capital requirements under Basel III, but it also experiences the most dramatic recovery thereafter; and,

Thailand: there is a minimal drop in the first few years but respectable recovery thereafter. A slight tapering-off in growth ensues right after the implementation of the countercyclical buffer.

The comparability of our predictions with that of previous studies that similarly assess the macroeconomic impact of capital rules under Basel III is limited due to differences in the sample period, assumptions, and methodology employed. We regard that our forecasts are preliminary evidence and could be refined by the use of alternative methods that incorporate structural and non-linear relationships in the model as well as the utilization of a different estimation technique such as through Bayesian methods. Furthermore, our assumption that banks will continue to maintain their existing magnitudes of capital buffers during the transition-phase under Basel III is reasonable, but others can be made as well.

6. CONCLUSIONS

This study has reviewed the major aspects of financial regulatory reforms that appeared after the GFC of 2007–09 from the point of view of their potential applicability to and implications for Asian economies and financial systems. These reforms include: the Basel III rules for capital adequacy and liquidity; related G20-inspired reforms in the areas of G-SIFIs, requirements for OTC derivative markets, and shadow banking; and related national legislation, especially Dodd-Frank in the US.

It is broadly expected that these reforms will bring about substantial benefits by reducing the risk of financial crises, enhancing the resilience of banks and other financial institutions in case crises do arise, reducing economic volatility, and increasing transparency. A number of studies have examined the potential impacts of these regulations on growth, but they have focused mainly on impacts in advanced economies. This is natural, since the regulations themselves were responses to conditions in advanced economies that led to the crisis, and advanced economies largely dictated the development of the new regulations. However, they will also apply to a great extent to emerging economies, including those in Asia, even when those economies did not experience financial crises, and have financial systems considerably different from those in advanced economies.

The Basel III capital adequacy rules appear unlikely to have a major negative impact on Asian economies. Capital ratios in the region are already high, and definitions of capital are conservative. This conclusion is generally supported by most studies of advanced economies, together with the small number of empirical estimates done for the region, including our own. Nonetheless, the capital adequacy rules may make it more challenging than otherwise to raise sufficient capital to support high growth rates in the region. Also, there are concerns about the impacts of capital rules for specific areas such as trade finance and foreign-currency swaps.

The Basel III liquidity rules may be more problematic. The less developed state of financial markets in emerging economies may result in a shortage of qualified safe and liquid securities. In this regard, the US Volcker Rule may contribute to such illiquidity by discriminating against non-US securities. Asian economies are potentially very sensitive to restrictions on liquidity due to their relatively highly dependence on bank lending in overall financing activity. Finally, the calculation requirements for the liquidity rules can be complex for emerging economy financial institutions.

Perhaps of greater concern for the longer-term is the potentially stunting effect of many rules on financial development and deepening in the region. Despite their much maligned status, derivatives are a key element of financial infrastructure. Rules on derivatives can raise transactions costs, make foreign-currency financing more difficult and costly, and discriminate against the development of local central clearing parties and other vital financial infrastructure. Legislation such as Dodd-Frank means many countries' financial systems are likely to be subject to double regulation, an extra burden for them. Uncertainties regarding resolution regimes for G-SIFIs can be another problem. These, together with the impacts of the Basel III liquidity rules, are important areas meriting further study.

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