Loan Loss Provisioning and the Business Cycle: Does Capital Matter?

Evidence from Philippine Banks

Danvee Floro[1]

This version: 15 March 2010

Abstract

Using a comprehensive and unique database of Philippine financial intermediaries from 2001-2009, we examine how the bank capital position influences the management of loan-loss provisioning. The results show evidence of capital management through loan-loss provisioning. We also find a procyclical behavior of banks in loan loss provisioning but such a link is influenced in a non-linear way by bank capitalization: both low-capitalized and well-capitalized banks provision by less (more) during an economic expansion (downturn).

[1] Correspondence address: Danvee Floro, Department of Economic Research, Bangko Sentral ng Pilipinas. dfloro@bsp.gov.ph. The author would like to acknowledge the guidance and valuable comments given by Mr. Leonardo Gambacorta. The author is also grateful to Dr. Johnny Noe Ravalo, Dr. Dennis Mapa, Mr. Jade Redoblado, Mr. Dennis Lapid and Mr. Jermy Prenio for their comments in an earlier draft of this paper. The views expressed in this paper are those of the author's and does not necessarily represent those of the Bangko Sentral ng Pilipinas.

1.Introduction

Loan-loss provisioning policy is critical in assessing financial system stability, in that it is a key contributor to fluctuations in banks' profitability and capital positions, which has a bearing on banks' supply of credit to the economy (Beatty and Liao, 2009). In principle, loan-loss provisions allow banks to recognize in their profit and loss statements the estimated loss from a particular loan portfolio/s, even before the actual loss can be determined with accuracy and certainty as events unfold and is actually written off. In other words, loan-loss reserves should result in direct charges against earnings during upturns in the economic cycle, as banks anticipate future losses on the loan portfolio when the economy hits a downturn. When these anticipated loan losses eventually crystallize, banks can then draw on these reserves, thereby absorbing the losses without impairing precious capital and preserving banks' capacity to continue extending the supply of credit to the economy. Ideally, the level of loan loss provisioning, should be able to reflect the beliefs of bank management on the quality of the loan portfolio that they have, indicating that provisions should be able to cover the whole spectrum of expected credit losses if they are to think of provisions as a measure of true credit risk (Dugan, 2009).

In practice, the level of provisioning has had a historically procyclical bias, as it is basically linked to contemporaneous problem assets, so that provisions mainly rise during a downturn (see Borio and Lowe, 2001; Bikker and Hu, 2002; Laeven and Majnoni, 2003), when credit risk has already materialized. There are some factors that contribute to its procyclicality: for one, business cycle developments are hard to identify, and therefore there may exist a disconnect between the timing of loan-loss provisioning and the assessment of credit risk. For another, accounting frameworks only allow provisioning for losses that have already been incurred as of a financial statement date, which does not really address the concept of "expected losses" (Li, 2009). Moreover, a surplus of funds relative to the appropriate level of prudent loans being granted could lead to the chasing of yields and the lowering of credit risk perception, and hence, corresponding provisions. If provisions are not able to cover the whole spectrum of potential loan defaults once an economic downturn occurs, then, naturally, the bank will need to cover the excess loss from its capital. As the recent global credit crisis have shown, the impact of an increase in loan defaults on financial system fragility also depended on whether banks build capital cushions to absorb unexpected loan losses not covered by provision levels.

The relationship between loan-loss provisions and capital—two of the most vital macroprudential policy tools by which supervisory authorities use to ensure banking stability—is linked by the BASEL II framework, the developments of which have lead to the

use of loan loss provisions to cover expected losses, and capital to cover unexpected losses (BCBS, April 2009).

The modification in the capital requirement regulation (Basel II) is a structural change that has several important policy implications. For one, the regulation stresses the importance of building up and maintaining the necessary capital given the specific risk profile of each bank. This suggests that different capital positions may have a bearing in the way banks react to an increase in risk—for given economic conditions—and hence in provisions. Second, the capital allocation feature of loan-loss provisions in the Basel II framework may provide incentives for banks to increase provisions to meet capital requirements.[2] In particular, banks with low capital levels may increase loan-loss provision levels in order to comply with the regulatory requirement and to mitigate solvency risk. Therefore, banks' capital adequacy ratios could have an important effect on banks' decisions in setting the optimal level of loan loss provisions (Beattie et al.1995).

In any case, it is then clearly of interest to investigate on the determinants of loan-loss provision decisions by banks, particularly the role of capital buffers in banks' provisioning decisions in the light of capital regulatory requirements to better understand the endogenous behavior of financial institutions and the dynamics of the relationship between provisions and macroeconomic variables in the Philippine case. As Laeven and Majnoni (2003) point out, the regulation of bank capital and loan loss reserves has to consider the incentives of banks to take into account macroeconomic shocks, together with the idiosyncratic ones in their loan loss provision decisions, especially for the stability of emerging market banking systems.

A number of studies have investigated both the proyclicality and the impact of capital adequacy positions using individual and cross-country data but were mostly focused on OECD countries (mainly U.S., Japan and U.K and Euro-area countries). In the Asian context, the most comprehensive study done was that of Craig et al. (2006), which used bank panel data from selected Asian countries. Meanwhile, Ghosh (2007) and Anandarajan et al. (2005) did similar studies for India and Australia, respectively. Because of its pioneering work on dynamic provisioning, a number of empirical studies on the impact of dynamic provisioning on Spanish banks' provisioning behavior have also been investigated.[3]

---

[2] Apart from provisioning for credit risk, banks can alternatively set reserves to meet management objectives (i.e. income objectives and signaling financial strength), and meeting capital adequacy requirements is one of those objectives. Given also that the calculation of *ex ante* credit risk is highly a subjective process, banks are nonetheless left with substantial managerial discretion in setting provisioning levels.

[3] Dynamic provisioning is an anticyclical type of provisions, which is put into place on top of the specific and general provisions, based on a comparison between a bank's current specific provisions and the average "latent loss" in its loan portfolio (Saurina.

Research on loan-loss provisioning in the Asian context offers a different perspective on the behavior of a sample of banks that, since having experienced a severe economic shock in the form of the Asian financial crisis, strengthened their prudential frameworks, i.e. stricter provisioning rules, which essentially resulted in loan loss reserve levels that are relatively higher than the levels in the advanced economies (Anklomkliew, et al., 2009).

The paper's contribution to the topic of loan-loss provisions is of an empirical nature. To our knowledge, there is no prior work done on the determinants of loan-loss provisions in the Philippines. During our analysis, however, we encountered the study done by Perez et al. (2006), which, in some respects, is similar to this paper. Using the case of the Philippines, we extend the literature on loan-loss provisions by documenting evidence of a strong association between capital constraints and provisioning, and looking more closely at the provisioning behavior of well- and low-capitalized banks—given supervisory capital requirements—in response to the macroeconomic environment and changes in credit risk, particularly in a bank-dominated financial system. We therefore analyse empirically the loan-loss provisions of Philippine banks by focusing on four issues: 1) whether there is a strong association between capital and loan-loss provisions given regulatory capital requirements; 2) whether there is a non-linear relationship between loan-loss provisions and the economic cycle with respect to the degree of bank capitalization; 3) whether the degree of bank capitalization influenced banks' provisioning decisions in response to credit risk; and 4) whether there is a difference in the behavior between banks with below and above-average loan losses in terms of capital management through loan-loss provisions.

It would be important to note, however, that the analysis of the determinants of loan-loss reserves must also be controlled for other alternative discretionary uses, one of which is income-smoothing, a very common practice on loan loss reserve management. We control for this by including net earnings before taxes and provisions as an explanatory variable. We also add macroeconomic variables to capture the procyclicality of provisions. The combination of bank-level explanatory variables along with macroeconomic variables provides an ideal vehicle to ascertain the impact of bank-specific characteristics on loan-loss provisions and to better understand its cyclical properties (see Dinamona, 2009; Gambacorta and Albertazzi, 2003 for earlier studies in the procyclical features of provisions).

While focusing on a single country due to lack of data availability poses some limitations in terms of branching out the scope of our analysis into a more inter-regional approach for Asia, it is instructive to note that the cross-sectional variability in cross-country studies suggests that the resultant estimates could be more in the nature of "average" relationships. Focusing on a single country enables to bypass this limitation of cross-country studies. The Philippines makes an interesting case in the study of loan-loss behaviour for the following

reasons: First, the Philippine banking system has undergone major changes in its prudential environment since the Asian financial crisis. Using the case of the Philippines, the comparison with what the provisioning behavior do banks from an emerging Asian economy take given regulatory capital requirements can help better understand the impact of regulatory policies going forward. Second, the Philippines has a relatively detailed set of rules on loan-loss provisioning. It would be therefore worthwhile to investigate whether despite the detailed rules on provisioning requirements, banks still have the incentives to engage in discretionary behaviour in terms of managing capital in particular. Third, a look at the Philippine banking system's typical portfolio underscores the importance of credit risk. Credit concentration on corporate lending tends to be high, and although Philippine banks entered the financial crisis with relatively strong capital positions, its high credit risk concentration on conglomerates makes the system vulnerable to a shock in the external environment, underscoring the importance of proper identification of credit risk in estimated expected losses.

We analyze by using a unique set of data that consists of quarterly balance sheet and income statement variables for Philippine banks over the period 2001-2009. In order to tackle the issue of endogeneity, we carry out a dynamic panel estimation by using the GMM estimator suggested by Arellano and Bond (1991).

The remaining sections of this paper is organized as follows: Section 2 discusses the related literature, section 3 provides a background on the Philippine provisioning and capital regulatory environment, section 4 explains the data used, section 5 explains the econometric model, section 6 presents the explanation of the results, and section 7 concludes.

2. Related Literature

2.1 Loan loss provisions and credit risk

Research on the determinants of loan-loss provisioning mainly takes into account two different behavioral components merging from different perspectives. The accounting and banking literature distinguishes these two as the non-discretionary and the discretionary components (Hasan and Wall, 2000; Wall and Koch, 2000; Pinho and Martins, 2009). The non-discretionary component is more closely linked to the concept of credit risk, wherein banks set aside loan-loss provisions according the underlying quality of their loan portfolio. The decision to set aside provisions depend on certain credit risk considerations: default risk, risk tolerance, and the macroeconomic environment (economic activity and monetary policy, for example), among others. In most countries, provisions are set up between the *specific* and *general* provisions, where the former represents identified loss in an individually assessed loan, or the amount of defaulted loans, while the latter is made against a portfolio

of loans, and the computation of which varies significantly across countries (Borio and Lowe, 2001)[4]. Perez et al. (2006) note that general provisions usually rise during an economic upturn, as banks give out more loans and the demand for credit is high during this period. During a downturn, loans to riskier companies would incur larger loan losses as risks materialize, and therefore higher specific loan-loss provisions follow.[5] Nevertheless, there is significant heterogeneity in the quality of the loan portfolio regardless of the cyclical position of the economy, due partly to the differing levels of intrinsic risk found in certain economic sectors. Apart from the fact that there are some sectors that are more prone to a boom-bust cycle than others (e.g. real estate sector), differing risk attitudes of bank management in the estimation of the expected loss of a given loan portfolio also contributes to the variability in loan quality. In this regard, the loan grade structure and collateral valuation plays a central role in ensuring the robustness of the provisioning process, as this essentially captures the loan's default risk probability. Anglomkliew et al. (2009) noted that an inadequate loan grading scheme could lead to distortions in a bank's balance sheet and an overstatement of capital and capital ratios. In a similar vein, Goldstein (1998), also noted that if loan classification is dependent only on the loan's payment status, without regard to the borrower's creditworthiness or to the market value of collateral, then the delay in recognizing bad loans can be considerable. And if non-performing loans are systematically understated, loan-loss provisions are apt to be too low, and bank net income and capital will be systematically overstated.

2.2. Loan-loss provisions, income management and signaling

Meanwhile, the discretionary component of banks' provisioning decisions arises from the uncertainty and subjectivity in the process of estimating expected losses. Empirical studies have shown that loan-loss provisions are used mainly in three types of discretional practices: 1) to smooth income; 2) to manage capital; and 3) to signal financial strength (see Beaver et al.,1996; Hasan and Hunter, 1999; Lobo and Yang, 1996).[6]

The income-smoothing hypothesis in loan loss provisions states that banks provision during times when they have higher earnings in order to smooth profits over time, as this gets a

[4] General provisions may be based on banks' own statistical models, or given as a fixed percentage of a loan portfolio, instead on individual loans.

[5] Specific provisions tend to be "backward looking", as accounting standards do not allow the creation of these provisions unless there is already evidence of a credit event.

[6] Lobo and Yang (2001) use a US sample for the 1981-1996 period and analyze the three discretionary effects including tax constraints simultaneously. They find strong evidence for income smoothing and some evidence of the signaling and capital management hypothesis when using the same measure of capital.

favorable response from stock investors (Kim and Santomero,1993; Wall and Koch, 2000). The private-control-benefits hypothesis states that managers, acting in the best interests of their shareholders, would smooth earnings in order to minimize the perceived riskiness of a bank's earnings and thereby maximize the bank's share price.[7] Several papers have tested the income smoothing behavior by banks through the use of loan-loss provisions in the cross-country context, but with contradictory results. On one hand, Collins, et al. (1995), Beaver and Engel (1996), Ahmed et al. (1999), and Laeven and Majnoni (2003) do not find evidence of income-smoothing. On the other one hand, Greenwalt and Sinkey (1988), Beatty, et al. (1995), and Wahlen (1994) all find strong evidence that banks use loan-loss provisions to smooth profits. Fonseca and Gonzalez (2008) document that transparency disclosures and heavier banking supervision minimizes incentives to engage in income smoothing. Fudenberg and Tirole (1995) show that in bad times, managers boost reported performance by shifting future earnings to the current period by making positive discretionary accruals, for example, loan-loss provisions. During good times, managers save current income for those future periods by making negative accruals. Perez et al. (2006) show that an introduction of a dynamic provisioning system actually minimizes this income smoothing incentive by banks. Meanwhile, Borio and Lowe (2001) discussed the merits of income smoothing in loan-loss provisioning, in that it reduces the negative impact of asset volatility on bank capital for risk-averse agents.

On the use of loan-loss provisions as a signaling mechanism, Liu et al. (1997), for US banks, showed that the market reacts positively towards an increase in loan loss provisions. They also found that increasing loan loss provisions imply higher cash flow predictions as this signals bank managers' resolve to address their non-performing loan problems. Eng and Nabar (2007) found similar results for their pooled, individual bank data from Malaysia, Singapore and Hong Kong, but observed that the signaling value of loan-loss provisions break down during the Asian financial crisis, as macroeconomic events altered the strategic behavior of banks. In contrast, Ahmed et al. (1999) show a negative association between bank stock returns and loan-loss provisions.

2.3 Loan-loss provisions and the capital management hypothesis

An aspect of provisions that is the major concern of this study is the relationship between loan-loss provisions and supervisory capital requirements, which are closely linked by virtue of the bank's level of risk as captured by its financial sheet position. In principle, bank capital serves two main functions: It represents 1) the shareholder value of equity, and 2) the value

[7] See Goel and Thakor (2003) for a detailed explanation of this hypothesis.

of the buffer stock available to absorb unexpected losses arising from extreme events. Meanwhile, the loan-loss provisioning to cover the expected losses completes the picture of the economic structure of a bank's balance sheet (McKenzie, 1995).

The presence of capital requirements tackles the fact that there is moral hazard in the banking system (Perez and Saurina, 2002). Public safety nets, information asymmetries and banks' high leverage give rise to the well-known moral hazard problem of risk-shifting. In practice, however, banks hold capital buffers that are well in excess of the minimum supervisory capital requirements. For example, in the Philippines, commercial banks on average, hold buffers that are around 7.4 percent higher than the regulatory minimum.[8] The reason why banks, in general hold capital buffers can be attributed to the fact that capital serves as a cushion against any cost due to unforeseen events and difficulties in raising additional capital (Dewatripont and Tirole 1994). These costs might come in the form of supervisory sanctions, the loss of charter value, or intensified supervisory intervention upon "falling below the minimum requirement" (Furfine, 2000). Since capital is sticky due to adjustment costs and possible illiquid markets, banks gain an incentive to hold excess capital buffers than what is required, and may use excess capital as an insurance against this "falling below the minimum requirement" (Milne and Whalley, 2001).

The Basel-type capital adequacy framework includes general provisions in the computation of Tier 2 capital, up to a limit of 1.25 percent of risk-weighted assets. Theoretically, this may give an incentive for capital-constrained banks to manage capital by increasing provisions. As such, results from empirical studies, are at best, conflicting. Bikker and Metzemakers (2004), Bushman and Williams (2007), and Moyer (1990) found a negative relationship between capital ratios and loan-loss provisions, while Collins et al. (1995), Beattie et al. (1995) and Eng and Nabar (2007) documented the opposite. The mixed results in testing the capital management hypothesis may be attributed to the fact that the amount of capital allocation in general provisions varies considerably across countries and jurisdictions and across sample periods. For example, Perez et al. (2006) posit that the relationship between provisions and capital will become positive (negative) if general provisions make up only a smaller (bigger) portion of total loan-loss provisions (recall that total provisions are made up of general and specific provisions), particularly if this ratio is less (more) than one minus the tax rate.

[8] Average from 2001-2006. Capital ratio includes Tier 1 and Tier 2 capital.

Meanwhile, Ahmed et al. (1999) found that the closer banks are to violating the regulatory requirements, the higher the probability that they will engage in capital management. Using loan growth as a proxy for violating capital requirements, the authors show that banks with an above-median percentage change in loans in a given year manage capital via loan-loss provisions. Some authors argue that this discretionary behavior would be synonymous to regulatory capital arbitrage, to the extent that capital management through loan-loss provisions increases the regulatory capital without affecting the bank's solvency (Bouvatier and Lepetit, 2008). In this respect, assessing the true capital adequacy of banks should go hand in hand with making the appropriate adjustments in the loan loss provisions to reflect changes in the portfolio credit quality. Berger et al. (1991), on a sample of US banks, showed that non-performing loans signaled future problems in an increase in loan write-offs for banks which have passed capital adequacy requirements.

Building on our preceding discussions, we now turn our attention on the link between loan-loss provisioning and the economic cycle depending on the degree of bank capitalization.[9] Prior research provides evidence that there is asymmetry on the influence of bank capitalization on loan-loss provisioning decisions because of varying risk attitudes of banks across different levels of capitalization (Stolz, 2007). A part of the literature claims that high-capitalized banks are more risk-averse than others, choosing less risky investments and loans, with a generally conservative pool of borrowers, thereby containing default risks in times of downturns or market reversal of conditions (Flannery, 1989; Genotte and Pyle, 1991). Following this interpretation, high-capitalized banks provision comparatively less during a downturn. The objective to reach a high charter value could also be a mitigating factor for banks' incentives to take on risks. Banks with high charter value may select less risky loan portfolios and higher equity capital levels to minimize their probability of a reduction in the equity price. Merton (1977) supports this idea by showing that banks with a low capital-to-assets ratio actually chose the maximal risk together with a minimum diversification.[10]

[9] In the papers that empirically investigated the procyclical nature of loan-loss provisions, the universal result is that loan-loss provisions are negatively associated with proxies of economic activity, e.g. GDP growth, unemployment and asset prices, among others (Hoggarth and Pain, 2002; Quagliariello, 2006; Craig et al. 2005).

[10] The link between bank capitalization and risk aversion is reversed by another important part of the literature. The main idea is that, when capital becomes relatively more costly, (especially in good times when the opportunity costs of holding extra capital is very high) well-capitalized banks may become less risk averse, thereby diversifying their loan portfolio into more risky investments (Kim and Sanomero, 1992). If this were the case, then capital buffers should be positively associated with loan-loss provisions in downturns. A group of papers (Shrieves and Dahl, 1992; Jacques and Nigro, 1997; Rime, 2001) also finds a positive relationship between capital and risk adjustments, in that banks that have built sufficient capital have, at the same time, increased their risk. This result supports the view of adverse incentive effects of capital requirements on bank risk.

Differing regulatory treatment of banks that are adequately or low-capitalized relative to banks that are well-capitalized could also contribute to the asymmetry in banks' loan-loss provisioning behavior for given economic conditions (Kim and Kross, 1998). Adequately capitalized banks may have frequent regulatory examinations and more regulatory restrictions on banking activity compared to well-capitalized banks. Especially during economic upswings, well-capitalized banks may have less frequent audits by regulatory agencies.[11] Because well-capitalized banks have less restrictions and less regulatory supervision, they may be more inclined to take on a short-term view of the credit cycle of their loan portfolio and therefore have a tendency to behave in a procyclical manner relative to low-capitalized banks.

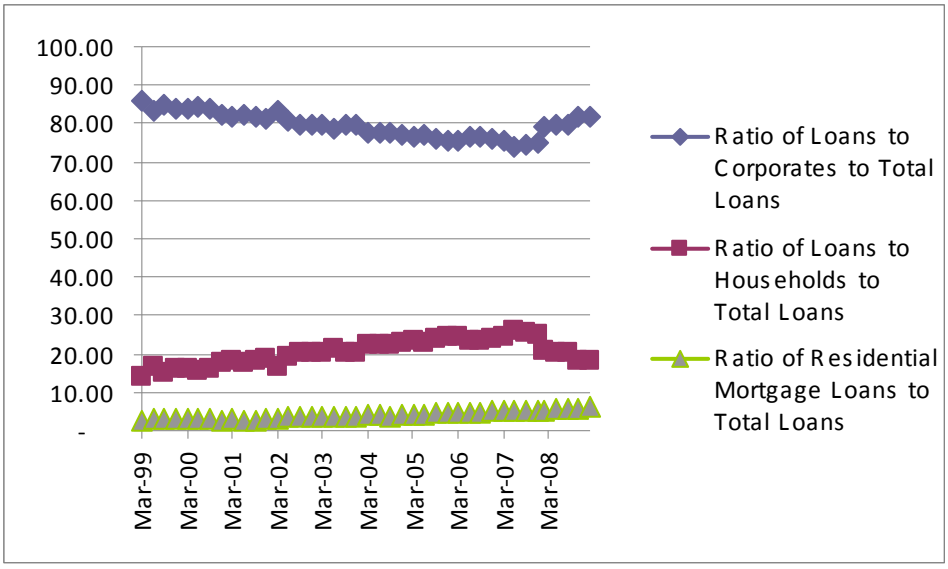
Finally, Bouvatier and Lepetit (2007) offer an explanation on the role of capital buffers on loan-loss provisioning. Developing a partial equilibrium model, they hypothesized that creating capital buffers to cover expected losses which are not covered by loan-loss provisions is an alternative form of a forward-looking provisioning system. In the capital buffer system, banks use the retained earnings to increase capitalization instead of increasing dividends during an economic upturn, thereby offsetting the effect of the business cycle on provisions.

3. Regulatory Background

The Philippine banking system is dominated by universal and commercial banks, accounting for around 88 percent of total banking assets, and 75 percent of which belong to the ten largest banks.[12] Conglomerates are an important feature of the financial system, with the country's top banks forming part of larger corporate conglomerates which also engage in trust, investment, securities, and insurance services, as well as foreign currency deposit units and thrift subsidiaries. Bank credit has traditionally been highly concentrated, with the ten largest borrowers accounting for around 35 percent of the largest banks' loan portfolios and around 70 percent of non-performing loans (NPLs) belonging to corporates.[13] Bank credit to the private sector was benign for most of the last decade, although bank lending accelerated after 2006. (fig 4). Meanwhile, housing finance has improved significantly, but is still low compared to that of Thailand, and Malaysia and public entities compose slightly over half of housing loans.

[11] Kanagaretnman et al. (2001) note that in the US, the Federal Deposit Insurance Improvement Act (FDICIA) of 1991 required that a full-scope, on-site examination of each insured depository institution be conducted not less than once during each 12-month period. However, the period is extended to18 months if the institution is well capitalized (Kim and Kross, 1998).

[12] as of December 2009



As consolidation of the Philippine banking system and financial sector reforms took root following the Asian financial crisis, authorities were clearly aware that the painful lessons of the 1997-98 crisis called for regulations governing banks' risk profiles that could adequately capture the true risk profile of the complex banking groups, as exposures could be divided between various group entities given the prevalence of financial conglomerates in the Philippine financial sector. An important step in this direction was the central bank's adoption of the Basel I risk-based capital adequacy framework in 2001 (based on the 1988 Basel Accord), with the risk-adjusted capital adequacy ratio set higher at 10 percent instead of the BIS' prescribed risk-adjusted capital ratio of 8 percent. There were a number of reasons for doing so, which included, among others, the weaknesses in banks' level of provisioning as well as the relatively fragile economic environment (Espenilla, 2005). The new regulatory framework thus prompted a subsequent increase in capital buffers (see Figure 3), with the banking system's consolidated capital adequacy ratio not having gone below 15 percent since the adoption of Basel standards in 2001. Under Philippine capital adequacy guidelines, general provisions may be included in Tier 2 capital up to 1 percent of risk-weighted assets, with the excess general provisions deducted from both the risk-weighted assets and capital.[14] In 2007, authorities adopted the more risk-sensitive and expanded Basel II framework, which include greater reliance on external ratings, addition of a capital

[13] Conglomerates have a significant presence in the Philippine economy, owning companies in telecommunications, energy, property and banking.

[14] For a more detailed information and explanation of the various compnents of regulatory capital for the Philippines, see the exposure draft of the Banko Sentral ng Pilipinas (BSP) Capital Adequacy Framework.

requirement for operational risk, and enhanced market disclosure.[15] As of December 2008, Philippine banks' average capital adequacy ratios remain higher than that of U.S. banks before and after the global credit crisis (Ree, 2008).

Apart from these upgrades in the capital regulatory framework, authorities also undertook several initiatives to reduce the level of credit concentration risk in the banking system.[16] Of particular interest are the comprehensive steps that the central bank took in strengthening bank loan classification and provisioning rules. In 2005, the Philippines shifted to a new accounting standard, which was in line with International Financial Reporting Standards (IFRS). The Philippines largely follows the loan impairment criteria (both individual and collective impairment) contained in IAS 39, but the authorities require financial intermediaries to report either the IAS-based provisioning or the central bank's recommended provisioning (see Table 1 below), whichever results in a higher reserve level.[17] Philippine authorities also required banks to set up a *general* provision account, on top of *specific* provisions for classified loans. For the general provisions, the central bank set a minimum requirement as a percentage of outstanding loans, being 5 percent for unclassified restructured loans and 1 percent of unclassified loans other than restructured.[18] General provisions are not tax-deductible, suggesting that banks may not have the incentive to pursue a dynamic provisions policy, and just maintain provisions at their minimum regulatory levels. However, it makes sense that banks should be concerned in providing a buffer against future risks in the macroeconomic environment. Meanwhile, specific provisions are required when the principal or interest payment is past due. To calculate the specific provisioning requirements, the Central Bank classifies bank loans into five categories, namely: pass (secured loans with no interest arrears and no reduction in principal), special mention, substandard, doubtful, and loss.

[15] The steady rise in the banking system's risk-adjusted capital ratio since the authorities' announcement of its planned adoption of Basel II in 2004 could have also reflected banks' preparation for the implementation of the said framework, with banks resorting to the issuances of innovative capital instruments for Tier 1 or Tier 2 capital (Prenio, 2007).

[16] In particular, the central bank issued regulations on single borrower limits and related-party lending. The related party lending rules were strengthened by broadening the definition of related interests, which now include entities under common control or with interlocking directorships or officer positions. Loan-to-value ratios were also set according to the type of loan granted and collateral used to secure the loan.

[17] Cayanan (2008) noted that the adoption of this accounting standard resulted in better disclosure practices of banks in terms of their non-performing loans and loan loss provisions.

[18] Restructured loans are loans whose principal terms and conditions have been modified in accordance with a restructuring agreement setting forth a new plan of repayment. The modification may include, but is not limited to, change in maturity, interest rate, collateral or an increase in the face amount of the debt (Section X322.1 of the Manual of regulations for Banks).

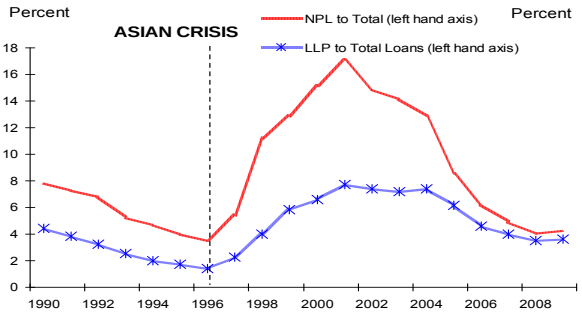
Classification	Allowances
i) Unclassified	0%
ii) Loans especially mentioned	5%
iii) Substandard	
Secured	10%
Unsecured	25%
iv) Doubtful	50%
v) Loss	100%

Loans whose principal and interest remain unpaid for 30 days or more, or are considered past due are considered non-performing loans, and are classified under the lower credit grades. It can thus be seen from the loan grading scheme that in order for specific provisions to be able to reflect the true likelihood of default, banks need to have a reliable method in determining impairment of assets, the quality of collateral and the percentage of the individual loan that is recoverable. Since Philippine banks implement property-based collateral lending, the illiquidity of property markets in the Philippines poses a challenge for loan-loss provisioning to capture real losses.

As general provisions would typically be larger than specific provisions during an upturn—as loans usually increase during this time—and the latter would dominate during a downturn, provisions have observably been procyclical, declining just before periods of banking/financial stresses and rising as credit losses mount. Figure 1 below plots annual GDP growth against the aggregate stock of loan-loss reserves as a proportion of total loans. By graphical inspection, it can be seen that provisions exhibit a cyclical pattern of total loans, coinciding with the peak in GDP growth in 1996. The Asian financial crisis, which started in July 1997, exposed the country's vulnerability to shocks. This fragility in the banking sector was further complicated by the fact that some systemically important banks that form part of larger corporate conglomerates were under severe stress. In the context of declining profitability and asset quality, the system appeared undercapitalized at the existing level of provisioning for bad loans.

Provisions peaked shortly after the trough in output in 1998 and only started to decline as output recovered and as the ratio of non-performing loans (NPL) started to decline starting in 2002, after peaking at 17.1percent in 2001.[19] Since provisions are a deduction from profits, the sharp increases in loan-loss provisions appeared to have a substantial impact on banks' profitability indicators. Return on equity (ROE) and return on assets (ROA) both declined following the increase in loan-loss reserves in 2001. Amidst a scenario of declining NPLs starting 2002, benign credit growth and macroeconomic environment, loan-loss provisions relative to total loans outstanding have gone down at a much more subdued pace. Possibly as a result of the lessons learnt from the Asian crisis, Philippine banks in general have since become more circumspect and confined their credit exposure to familiar top‐tier names (typically the large conglomerates), which may have better resilience in a downturn. This may have resulted in increased competition among commercial and universal banks in vying for a small pool of top-tiered corporate loan accounts. Meanwhile, the effects of the recent global credit crisis on the Philippine banking sector have thus far been benign, mitigated mainly by the improvement in bank asset quality on the back of measures taken to clean up banks' balance sheets, including tax and regulatory

Fig 2. Ratios of NPL and Loan Loss Provisions to Total Loans



[19] Many NPLs were related to property lending. Philippine banks have a credit culture that tends to be reliant on collateral-based lending, and the burst in the proeperty bubble during the crisis gave rise to structural NPLS.

incentives as well as the major improvements in risk-based supervisions. The initial impact of the credit crisis was felt on banks' trading books, with second round effects already evident in smaller and less-capitalized banks, as their NPL ratios have risen by more than twice that of the bigger commercial banks. On a system-wide basis, loan-loss-reserve ratios rose sharply in the last quarter of 2007, along with the correspondent rise in the risk profile of the top banks in the country. This trend may be reflective of the continued procyclicality of loan-loss provisioning behaviour in the Philippine case.

Fig. 1 Loan Loss Provisions to Total Loans and GDP

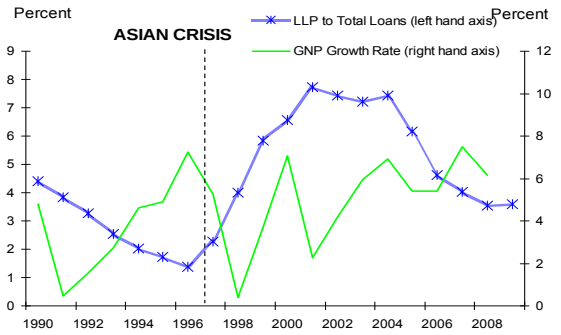


Fig. 3 Capital Adequacy Ratio

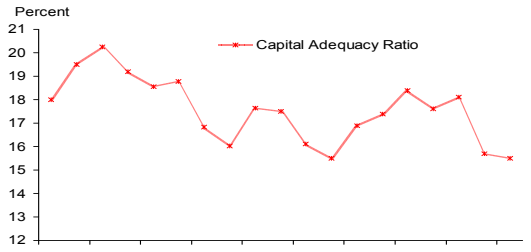
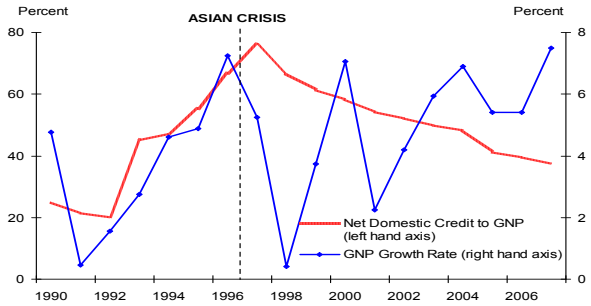


Fig. 4 Net Domestic Credit to GDP



4. Data Description

We have obtained consolidated bank balance-sheet and income statement data from the Supervisory Data Center of the Central Bank of the Philippines from 2001:q1-2009:q1. We chose to start the sample in 2001 as this marks the beginning of the series on risk-adjusted

capital ratios, as well as a more consistent definition of non-performing loans.[20] Our panel is unbalanced and includes 38 commercial banks, 17 foreign banks and 21 domestic banks. The Philippine banking system is heterogenous across banking groups, which may cause instability in the coefficients across different banking groups. Hence, we consider only commercial banks in the sample, as they are the main provider of corporate loans in the Philippines. This sample covers around 90 percent of total assets of the financial system as of end-December 2009. In checking for outliers particularly for capital buffers, we drop an entire bank if it has negative capital buffers throughout most of the series. Thus, from an original set of 38 banks and 1,115 observations, we are now left with 32 commercial banks and 987 bank-quarter observations. Table 1 provides some descriptive statistics of the variables: Both the loan-loss reserves and the non-performing loans as a proportion of total assets were on average 4.6 percent. Total loans made up almost half of total assets on average. Throughout the observation period, the commercial banks in the sample held an average capital buffer of 15.6 percent, while the mean risk-adjusted capital ratio for the sample stood at 25.5 percent.

5. The econometric model

We model the determinants of current loan-loss reserves, as a function of economic conditions and bank-specific characteristics. We adopt a model similar to Perez et al. (2006), Fonseca and Gonzalez (2008), and to some extent, Bikker and Metzemakers (2004), adapted by using the loan-loss reserves to total asset ratio (LLR_{it}) as the dependent variable. The LLR captures more the overall credit portfolio quality, as it provides a direct link between the optimal level of total provisioning and the real quality of the loan portfolio (the same approach has been used by Bikker and Metzemakers (2004)). Using loan-loss reserve levels are more important for financial soundness indicators, as opposed to loan-loss provision charges.

Our model assumes that banks determine the optimal level of loan-loss provisioning with three main objectives: 1) to provision for credit risk; 2) to meet capital requirements; and 3) to smooth income. Macroeconomic variables are included at time t and are treated as exogenous. Meanwhile, all bank-specific characteristics are set at time t-1 to avoid endogeneity problems. The meaning of all the variables and their summary statistics are provided in Table 1.

[20] The number of days by which unpaid loan accounts (whose principal and/or interest is unpaid) is considered non-performing loans was shortened to 30 days or more after the due date from 90 days. (Circular no.202 dated 27 May 1999).

$$LLR_{it} = \alpha + \delta f(\text{CREDIT RISK}) + \beta \text{INCOME}_{it-1} + \gamma \text{BUFFER}_{it-1} + \mu \text{CONTROL VARIABLES} + \pi_i + \varepsilon_{it} \quad (1)$$

The parameters δ, β, γ, μ are to be estimated with the main hypothesis that γ is not significant from zero, since the Philippines has a detailed set of rules on loan-loss provisioning which would not make it plausible for Philippine banks to engage in such discretionary behaviour. The variables chosen as possible explanatory variables for the loan-loss reserves ratio are the ones traditionally used for testing both non-discretionary (credit risk variables as in point 1 above) and discretionary components (to meet capital requirements and to smooth income as in points 2 and 3 listed above) of bank loan-loss provisioning. Expanding the model, we now have the following:

$$LLR_{it} = \beta_0 + \beta_1 LLR_{it-1} + \beta_2 NPL_{it-1} + \beta_3 INCOME_{it-1} + \beta_4 LTA_{it-1} + \beta_5 GDP_t + \beta_6 BUFFER_{it-1} + \beta_7 MONPOL_t + \beta_8 SIZE_t + \beta_9 REG + \Theta_t T_t + \pi_i \varepsilon_{it} \quad (2)$$

The proxies that we used for credit risk are NPL_{it-1}, $GDP_{t,}$ and $LTA_{it-1.}$. NPL is the ratio of non-performing loans to total assets, and it measures the rise in the bank's actual default risk. The NPL as an *ex post* measure of loan portfolio quality, as this may contain information on risk differences by banks not captured by traditional measures of risk, i.e. risk-weighted assets to total assets ratio.

LTA is the ratio of total loans (net of interbank positions) to total assets, and it measures the overall risk exposure of the bank in its intermediation activities. On average, corporate loans have made up around 80 percent of total loans on a system-wide basis. Of the corporate loans, a substantial portion belongs to commercial and industrial loans, which include credit to construct business plants, and for business operating expenses, among others. Gorton and Rosen (1995) found evidence that banks with a substantial portion of commercial and industrial loans in their total loan portfolio also have higher levels of non-performing assets. Thus, the LTA may be considered as an *ex ante* measure of credit risk, and the higher the proportion of lending over total assets, the higher the credit risk of bank managers.

GDP_t is a proxy for business cycle conditions, which is used to capture the procyclicality of loan-loss provisions, if any. The coefficients NPL_{it-1}, $LLR_{it-1}$and LTA_{it-1} are expected to be positive, while that of GDP is expected to be negative.

Lagged independent variable. Following Laeven and Majnoni (2003) and Fonseca and Gonzalez (2008), we add a lagged value of the dependent variable, LLR_{it-1} which captures the autoregressive component in the emergence of doubtful assets after the first quarter. If banks adjust their provisions slowly to recognize potential losses against loans following a default event, then provisions could be systematically related to the previous period. The lagged dependent variable takes into account a change in the speed of adjustment of loan-loss provisions. We expect a positive coefficient for the lag.

Monetary policy rate. We add also the short term interest rate ($MONPOL_{it}$) to capture possible links between funding costs of borrowers, thereby increasing the probability of default of the loan portfolio at variable rate (Gambacorta and Albertazzi, 2009). In the context of a broad credit channel, firms may obtain all forms of external finance at a cost premium. This external finance premium compensates lenders for the monitoring and evaluation of loans and is affected by the stance of monetary policy. A monetary tightening raises the external finance premium of all funds. This affects a borrower's balance sheet in at least two ways. One, higher interest rates raise the interest expense, reducing the borrower's net cash flow and weakening its financing position. Two, higher interest rates shrink the value of the borrower's collateral since these are typically associated with declining asset prices. In both cases, the decline in the borrower's net worth. (Gertler and Gilchrist, 1993). A decline in the borrower's net worth decreases the borrower's capacity to pay, thereby prompting an increase in loan-loss provisions. Therefore, we expect $MONPOL_{it}$ to be positively associated with loan-loss reserve levels.

Capital buffers. Majority of studies done on loan-loss provisioning used the ratio of capital to assets as proxy for capital management on loan-loss provisions. In this paper, we instead use the excess risk-adjusted capital to asset ratio, as this measure can better control for the riskiness of a bank portfolio (Gambacorta and Mistrulli, 2004), and which will be our critical explanatory variable. Higher loan-loss provisions when capital is low is linked to banks' efforts to build up a higher loan loss reserve cushion, which is consistent with the capital management hypothesis (see Ahmed et al., 1999; Cortavarria et al., 2000; Craig et al., 2005; and Bikker and Metzemakers, 2005). Meanwhile, a bank that is well above the supervisory minimum capital requirement may see little additional gain in increasing loan-loss provisions, in the sense that they are more conservative and may be holding a lesser share of risky loans (and hence incur less losses and provision less). This also engenders a negative relationship between capital and loan-loss provisions.

Kim and Kross (1998) observed that when the bank increases its provision allowances, it is effectively reducing its profits, and hence retained earnings which are part of bank capital. However, if provisions are tax deductible, then, the bank is decreasing its tax costs while

increasing provisions. Nevertheless, this only leads to a small increase in capital. Given the limit in the inclusion of general provisions in the computation of regulatory capital in the Philippines and with the fact that provisions are not tax-deductible, we view that banks with relatively low capital levels may not have the incentives to increase provisions as this would lead to lower capital via lower profits and retained earnings. That being the case, we expect a positive coefficient for BUFFER.

Income before taxes and provisions. Most of the papers that analyse the discretionary components of loan-loss reserves always tests for the income smoothing and capital management hypotheses at the same time (Beattie et al., 1995; Shackelford and Wahlen, 1995; Ahmed et al., 1990). We therefore include in the econometric specification as additional control the variable $INCOME_{it-1}$, earnings before taxes and provisions. Evidence of income smoothing by banks would mean that banks use their accounting discretion over loan–loss reserves to move their earnings closer to the target (Hassan and Wall, 2000). The impact of income on loan-loss provisions could be both sides. On the one hand, it is worth noticing that weaker banks may have more incentives to understate loan-loss provision levels in order to boost their profits (Anandarajan and Mcarthy, 2006). On the other hand, Craig et al. (2005) note that a positive association between earnings and loan loss provisions could also be indicative of forbearance or lax supervision with weaker banks. Hence, if there is evidence of income smoothing in Philippine banks, then we expect the coefficient of INCOME to be positive, as a consequence of a "low earnings-low provisions" policy (Pinho and Martins, 2009).

Size. As in most studies, we will also control for the size of the bank, proxied by the log of total assets. The banking literature notes that bigger banks may have greater chances for diversification, and therefore could better reduce overall risk exposure as compared to smaller banks that don't have much opportunity to diversify their loan portfolio. We do not have an expected sign for SIZE.

Dummy variables. We add a time dummy variable for the Philippines' implementation of the Basel II framework which takes the value of 1 for the period 2007:q2-2009:q1 and zero otherwise. The upgrade to the regulatory framework sent strong signals to the banking industry to upgrade risk management systems to build up their capital positions and to reduce risk exposures especially to non-performing accounts. During this time, banks raised both Tier 1 and Tier 2 capital and took advantage of the special purpose vehicle (SPV) law to unload non-performing assets that accumulated during the 1997 crisis. We also add seasonal dummy variables to capture the effect of seasonality on banks' provisioning behaviour.

In testing for asymmetries in the degree of bank capitalization in terms of loan-loss provisioning, we create a set of dummy variables WELL and LOW. We define the dummy variable WELL, which takes the value of 1 if a bank is among the 10 percent well-capitalized banks in its banking group for the given time period and zero otherwise. Meanwhile, the dummy variable LOW takes the value of 1 if the bank is among the 10 percent least capitalized bank among its group for the quarter and zero otherwise.[21] The idea behind this definition is that if a bank is well-capitalized relative to its peer group, it may have a different risk attitude relative to the low-capitalized banks, hence variability in loan-loss provisioning behaviour may arise. Once we have defined the dummy variables WELL and LOW, we interact these two with GDP, and the one-quarter lagged values of NPL and LTA, in order to test for the presence of asymmetric patterns in banks' loan-loss provisioning for well-capitalized and low-capitalized banks in response to an increase in loan losses (NPL) and *ex ante* credit risk (LTA). To test the proposition (Bouvatier and Lepetit, 2007) that building capital buffers during an upturn may mitigate the procyclicality of provisions, we interact the variables WELL and LOW with GDP (proxy for procyclicality). A positive sign for the interaction variable WELL_GDP (WELL X GDP) indicates that well-capitalized banks are more forward-looking, or adjust loan-loss provisions accordingly with an increase in risk, thereby mitigating procyclical impact of economic fluctuations on provisions.

Table 3 shows the correlation matrix of the regression variables. LTA, NPL and SIZE were positively correlated with loan-loss reserves and significant at the 1 percent level, and were in line with previous findings in the literature. INCOME is likewise positively correlated but not significant at conventional levels. BUFFER is negatively correlated with LLR, indicating that capital management may be present in banks' provisioning decisions. GDP and LLR are inversely correlated, suggesting that loan-loss provisions are procyclical. The opposite sign between SIZE and BUFFER suggests that bigger banks may be better able to economize on capital per unit of asset. Unexpectedly, we find a negative and insignificant relationship between MONPOL and LLR. The simple correlation results, however, do not allow other variables to affect the relationship and thus do not give clarity to the possibility that the correlations may be due to simultaneous changes in the variables themselves. The use of a dynamic panel estimation, therefore, would serve to account for various additional factors that could affect the level of loan-loss reserves to provide a deeper understanding of the relationships.

[21] As a robustness check, we also used other thresholds to distinguish between banks with low and high capital buffers. The results are consistent with different thresholds. However, the higher the threshold, the more banks with adequate capital buffers are considered low capital buffered-banks. Hence, the difference in the effects between low and high capital buffers declines as the thresholds widen.

Given the presence of the lagged endogenous variable and potential endogeneity problems given by the bank-specific characteristics even if at time t, we have applied the generalized-method-of-moments (GMM) estimator developed for dynamic models of panel data by Arellano and Bond (1991). This method is designed specifically to address three main econometric problems: 1) the presence of unobserved bank-specific effects, which is eliminated by taking the first differences of all the variables; 2) the need to capture the dynamic nature of loan-loss reserves through the inclusion of a lagged dependent variable; and 3) the likely endogeneity of the explanatory variables. Other empirical studies on loan-loss provisions use this estimator: see for example, Fonseca and Gonzalez (2008), Bouvatier and Lepetit (2007), and Laeven and Majnoni (2003) in an international context and Perez et al. (2006) for the Spanish banking system.

To address the problem of potential endogeneity of the bank-specific variables, we used two to four period lags of the same variables as instruments. We also consider two specification tests suggested by Arellano and Bond (1991). The first is the Sargan test of over-identifying restrictions, which tests for the validity of the instruments. The second test is the absence of second-order serial correlation in the first difference residuals (*m2*).

6. Results

Results are presented in Table 2. They report the one-step estimates of the Arellano and Bond (1991) dynamic data panel (DPD) package with seasonal dummies. The first column presents the baseline equation and the coefficients of the credit risk variables, namely NPL_{it-1}, LLR_{t-1}, and LTA_{it-1} as well as macroeconomic variables all have the expected positive signs and each variable is significant at conventional levels. The coefficient attached on LLR_{t-1} is around 0.65 (with a speed of adjustment of 0.35=1-0.65), indicating a certain degree of inertia in loan-loss reserves.

The positive but not too significant value of the LTA coefficient implies that the average bank increase provisions, the higher their exposure to credit risk. A 1 unit increase in the LTA will result in a .02 unit increase in the LLR, which suggests that although banks adopt a relatively prudent behaviour by increasing the LLR with an increase in loans, they do not increase provisioning proportionally. Meanwhile, banks appear to be responsive to an increase in NPL in the previous quarter, as they are immediately provisioned for in the current quarter.

REG is positive and significant at the 1 percent level, indicating that provisions were high during the period 2007q1:2009q1. In line with expectations, GDP is significantly negative, confirming the existence of a very strong cyclicality of provisions in Philippine commercial banks, indicating that provisions rise when economic growth is weak. The business cycle influences the capacity of firms and households to service debt, therefore GDP growth

modifies the credit exposure of banks. A decline in GDP growth would mean an increase in actual as well as expected credit losses. Meanwhile, an increase in the monetary policy rate is in line with the "financial instability hypothesis" (Minsky,1975), wherein higher short-term interest rates increases the burden of debt servicing for borrowers, thereby exacerbating the fragility of the financial system and the negative spillovers to the real economy (see, for example, Gambacorta and Albertazzi, 2009 for a similar result).

Our critical explanatory variable, BUFFER is negative and significant at the 1 percent level for all specifications, which is in line with the capital management hypothesis. For given economic conditions, a unit increase in the initial level of excess capital translates into a decrease in loan-loss provisions by .02. This provides an interesting result in that despite the fixed rules on general provisions for the Philippines, banks still seem to manage capital using loan-loss provisions in the context of the capital management theory. As banks attain sufficiently high capital buffers, there may be little expected gain for banks to increase provisions in order to manage capital, similar to an insurance against "falling below the minimum capital requirement" (Linquist, 2004). The negative relationship between capital and provisions also imply that capital is related to provisioning in a way that may exacerbate financial system procyclicality, since capital buffers usually increase during an economic upturn while provisions decline.

INCOME is positive and significant across all model specifications (Table 2), which indicates that Philippine banks appear to also "smooth income" using loan-loss provisions. It is instructive to note that the effect of the income smoothing variable on loan-loss provisions is much stronger than the capital management variable BUFFER. The result is in line with that of Fonseca and Gonzalez (2008), which test the income smoothing hypothesis in 31 countries (including the Philippines). This countercyclical behaviour as reflected by the coefficient of INCOME somewhat mitigates the impact of the business cycle (GDP) on provisions, as Philippine banks appear to provision considerably well when they have higher earnings (which usually happens when the economy is doing well) and vice versa.

The control variable SIZE is negative significant at conventional levels, indicating that there seems to be a strong and significant negative size effect on provisions.

The results also show a systematic seasonal variation in the loan-loss reserves, as evidenced by the significant coefficients of the quarterly dummy-variables, Q2, Q3 and Q4. Provisions tend to be highest in the fourth quarter and lowest in the second quarter, which may be due to a higher focus on the results at the end of an accounting year.

In column 2, we check the robustness of the results by re-estimating the equation in column 1 by substituting BUFFER with the risk-adjusted capital ratio (CAP). The results are qualitatively unchanged, as can be seen in column 2.

In column 3, we try to expand the model by including an interaction term that tests for the influence of well-capitalized banks on the procyclical behaviour of provisioning, as captured by GDP. We also examine the effect of low-capitalized banks by adding LOW_GDP (LOW x GDP). For well-capitalized banks, a 1 unit increase in GDP growth will lead to a 0.26-unit decline in loan-loss provisions. This finding implies that well-capitalized banks may also be assuming a backward-looking risk assessment, as perceptions of risk for this banking group is also low during upturns. Low-capitalized banks appear to be behaving in the same procyclical manner, but the magnitude is higher for this group, with a coefficient of 0.80 as compared to well-capitalized banks. The results then indicate that bank capital seems to influence banks' loan-loss provisioning decisions across the economic cycle in a non-linear way, in that both well- and low-capitalized banks behave in a procyclical manner, with low-capitalized banks provisioning a lot less (more) than well-capitalized banks during an economic upturn (downturn).

Does the degree of bank capitalization matter in banks' behaviour in provisioning for actual loan losses? Kim and Kross (1998) found an insignificant effect of the lagged NPL ratio on loan-loss provisioning for low-capitalized banks but found a significant and positive effect for well-capitalized banks. In column 4 of table 2, our results show a negative and statistically significant effect of non-performing loans for LOW_NPL and WELL_NPL. The results indicate that both well- and low-capitalized banks decrease their provisions when they incur loan losses, with the latter provisioning a lot less than the former. When faced with an increase in loan losses, well-capitalized banks may be choosing to absorb the losses through its capital. Meanwhile, the result of a negative influence of low-capitalized banks on provisions given actual loan losses could be explained by forbearance on the part of low-capitalized banks. This implies that during periods of economic weakness, low-capitalized banks do not provision enough during good times to cover losses during bad times.

Column 5 provides the results of the inclusion of the interaction variables WELL_LTA and LOW_LTA, which attempts to shed light on the question of how well-capitalized and low-capitalized banks take into account an increase in *ex ante* credit risk in their provisioning decisions. We find that both WELL_LTA and LOW_LTA are negatively associated with loan-loss provisions at the 1 percent level of significance, suggesting a less prudent behaviour on the part of well-capitalized banks during periods of economic upturns (as leverage usually increases in an upturn). Between the two banking groups, however, the effect of a low-capitalized bank on the loan-to-asset ratio in bank provisioning is stronger than that of the

well-capitalized bank. In the aftermath of the Asian crisis, Philippine banks sought to lend mainly to top-tiered corporate accounts, which have led to increased competition among universal and commercial banks targeting a relatively small number of top–tier Philippine institutions. Most of the corporate loan exposure of banks is to large local companies (which are also collateralized), and are perceived to have lower riskiness than smaller and medium–sized corporations. This may have lowered banks' perceived threshold for the riskiness of an increase in the financial leverage of its corporate borrowers.

Sub-sample approach

We further test whether there is a difference in the discretionary behaviour (i.e. capital management) for banks who incur above-average loan losses as compared to those who have lower than average loan losses. We compute the average non-performing loan ratio of each bank across the sample period and divide the sample into banks with above-average NPL and below-average NPL. The average non-performing loan ratio for the whole sample is 4.1 percent for 2001-2009. We performed the same estimation in equation (2) using the same methodology discussed in section 5. Table 5 presents the results for banks with above-average loans losses and banks with below-average NPL. The results show that for banks with above-average loan-losses, BUFFER and INCOME are insignificant, but LTA and NPL are highly significant and with the expected signs. This suggests that banks with above-average losses do not engage in discretionary behaviour (i.e. capital management) and is mainly driven by credit risk variables in their provisioning behaviour. Meanwhile, the provisioning behaviour of banks with below-average loan losses is driven more by discretionary behaviour, particularly capital management, and is less influenced by an increase in credit risk, i.e. LTA. Nevertheless, both groups exhibit procyclical behaviour, as shown by the negative and significant coefficient of GDP.

Overall, we can conclude the following:

1. It seems that Philippine banks' loan-loss provisioning practices depend quite strongly and negatively on the beginning excess risk-adjusted capital to asset ratio, evident of capital management practices despite the detailed rules on general provisions for Philippine banks. There is also strong evidence of income management/smoothing through the use of loan-loss provisions, which somewhat mitigates the procyclicality of provisions.
2. Consistent with the worldwide empirical evidence, loan-loss provisions exhibit a procyclical behaviour over the sample period 2001-2009 for Philippine banks.
3. However, when examining differential bank capitalization, we find that the link between loan-loss provisions and the economic cycle is influenced in a non-linear

way by bank capitalization. Both low-capitalized and well-capitalized banks provision by less (more) during an economic expansion (downturn).

4. Both well- and low-capitalized banks provision less when they incur loan losses, suggesting that well-capitalized banks may be using their capital as substitute in absorbing expected losses, while low-capitalized banks may be not be adequately provisioning in an effort to preserve earnings and capital.

7. Conclusion

In this paper, we have investigated the presence of capital management in loan-loss provisioning of Philippine banks. Using dynamic panel data estimation techniques on Philippine banking data for the period 2001-2009, we find a strong and negative relationship between capital and loan-loss provisions (substitution), which is in line with the capital management hypothesis. We also find clear evidence of income smoothing through specific and general loan-loss provisions. The study offers several policy implications: First, despite detailed and specific rules on loan-loss provisions, capital decisions seem to be intertwined with loan-loss provisioning decisions for the Philippine case. Since capital normally increases during an economic upturn, low provisioning levels when capital is sufficient may contribute to the procyclicality of the financial system once an economic downturn sets in. The expanded Basel II framework underscores the separate treatment of expected losses, which shall be covered by loan-loss provisions, and the unexpected losses by capital. Given that there seems to be a substitution between provisions and capital in the Philippine case, it would make sense going forward, to promote a more forward-looking and flexible accounting framework that would allow for the full coverage of expected losses through loan-loss provisions. The development of a more forward-looking approach to provisions would greatly complement the existing Basel II framework, which allows for banks to set aside more capital to cover the deficit in loan-loss provisions, if any.[22] From a prudential perspective, putting in place a loan-loss provisioning framework that captures ex ante credit risk or "expected losses" and not wait until losses have materialized by covering them with capital will further reinforce the solvency of banks and can help minimize the volatility in the performance indicators of individual banks and the financial system as a whole. However, many argue that increased prudence in loan-loss provisioning may be at the expense of transparency. Nevertheless, Pillar III (enhancing market discipline) of BASEL II could provide the necessary tools to enhance the reliability of banks' reports on its financial risk conditions, by

[22] See Li (2009) for a discussion of the different accounting frameworks being considered in promoting a more forward-looking approach to loan-loss provisioning.

enforcing banks to disclose its loan loss provisioning methods as well as provide information on its expected loss calculations.[23] In this way, investors, market analysts and regulators themselves can be assured of the proper estimation of a bank's profits and capital (Fonseca and Gonzales, 2008).

Second, the finding that there is a non-linear relationship between loan-loss provisions and the economic cycle as well as with proxies of credit risk with respect to the degree of bank capitalization—such that provisioning behaviour is more procyclical for low-capitalized banks—further underscores the importance of strengthening the supervisory oversight of financial institutions, with a view to avoiding the tendency to excessive risk-taking. Pillar II of BASEL II's bank-by-bank differentiation of capital requirements which takes into account the risk profile, risk capacity and the systemic importance of the bank could help mitigate maximal risk-taking by banks. However, it would be helpful to introduce robustness into the framework considering that risk-based capital may still ignore some risks and that the measurement of risk weights may still be prone to some measurement error. Having a countercyclical provisioning system (i.e. Bank of Spain's dynamic provisions) is one way of doing so.

Finally, loan-loss provisions continue to have a highly procyclical behaviour. Given that credit cycle developments would have its initial impact on expected losses, bank regulators stressed the importance of—as a first line of defense—the recognition of *ex ante* credit risk using loan loss provisions very early on in the loan portfolio cycle, which usually starts during an upturn in the business cycle. This should do the job of reflecting the true risk of the loan portfolio as well as a more accurate income stream, thereby preventing an upward bias in the level of earnings and dividend distribution during good times.

Table 1. Summary Statistics and definition of the variables used in the empirical analysis

[23] Apart from requiring banks to disclose on the amounts of specific and general provisions, classified loans and other risk assets, among others, the BSP has also been requiring banks to include in their periodic and other relevant financial reports: the staggered recognition of actual loss on sale/transfer of non-performing assets (NPAs) and/or impairment, if any, on the measurement of financial instruments at the end of the fiscal year following the sale and transfer of NPAs.

Sample period: 2001-2009 (quarterly data)

Sample size: 987 observations

(in percent)

	Mean	Standard Deviation	Minimum	Maximum
LLR	4.6	5.9	0	23.8
INCOME	1.0	1.0	-3.3	7.2
LTA	48.3	13.6	7.6	87.9
SIZE	24.7	1.3	22.1	27.4
NPLR	4.6	4.5	0	27.1
GDP	2.5	0.50	1.1	3.4
BUFFER	15.5	16.5	-6.4	116.6
CAP	25.5	17.9	3.6	164.8
MONPOL	6.8	0.89	4.8	9.0

LLR: ratio of total loan-loss reserves over total assets

INCOME: ratio of net income before taxes and provisions

LTA: ratio of total loans to total assets

SIZE: log of total assets

NPL: Ratio of non-performing loans to total assets

GDP: GDP growth

BUFFER: Capital buffer (the relative excess capital-to-risk-weighted-asset ratio held by the bank)

CAP: Risk-adjusted capital to asset ratio

MONPOL: monetary policy rate

Table 2. Estimation of the model of determinants of loan loss reserves by Philippine banks

Dependent Variable: LLR_{it}

Estimation method: GMM, equation in first differences

Dependent variable: Loan-loss reserves to total assets LLR_t	(I) Using Excess Capital		(II) Using Capital to Asset Ratio		(III) Influence of well-capitalized banks on the cyclicality of provisions		(IV) Influence of bank capitalization on bank provisioning for default risk		(V) Influence of bank capitalization on bank provisioning for an increase in risk tolerance	
	Coeff.	S.Error	Coeff.	S.Error	Coeff.	S.Error	Coeff.	S.Error	Coeff.	S.Error
1) Credit Risk										
LLR_{t-1}	0.646 ***	0.010	0.644 ***	0.009	0.673 ***	0.009	0.650 ***	0.011	0.701 ***	0.019
NPL_{t-1}	0.244 ***	0.029	0.243 ***	0.028	0.227 ***	0.027	0.262 ***	0.030	0.206 ***	0.026
LTA_{t-1}	0.018 *	0.009	0.019 **	0.009	0.015 *	0.009	0.017 *	0.009	0.021 ***	0.008
2) Bank Specific										
$SIZE_{t-1}$	-0.009 ***	0.002	-0.009 ***	0.002	-0.009 ***	0.002	-0.009 ***	0.002	-0.008 ***	0.001
$BUFFER_{t-1}$	-0.024 ***	0.006			-0.024 ***	0.006	-0.024 ***	0.005	-0.022 ***	0.006
CAP_{t-1}			-0.022 ***	0.006						
$INCOME_{t-1}$	0.387 ***	0.114	0.381 ***	0.110	0.373 ***	0.127	0.387 ***	0.115	0.353 ***	0.122
3) Control/ Macro Variables										
GDP_t	-0.888 ***	0.095	-0.888 ***	0.095	-0.743 ***	0.077	-0.9003 ***	0.0853	-0.610 ***	0.064
$MONPOLR_t$	3.519 ***	0.219	3.533 ***	0.222	3.233 ***	0.198	3.462 ***	0.206	3.045 ***	0.177
REG	0.064 ***	0.004	0.064 ***	0.004	0.058 ***	0.003	0.063 ***	0.004	0.054 ***	0.003
4) Interaction Variables										
WELL_GDP					-0.262 ***	0.044				
LOW_GDP					-0.799 ***	0.069				
WELL_NPL							-0.072 ***	0.018		
LOW_NPL							-0.116 **	0.052		
WELL_LTA									-0.009 ***	0.002
LOW_LTA									-0.065 ***	0.005
Constant	-0.010	0.036	-0.029	0.042	-0.002	0.040	-0.007	0.037	-0.014	0.037
Seasonal Dummies	yes		yes		yes		yes		yes	
Sample period	2001-2009		2001-2009		2001-2009		2001-2009		2001-2009	
No. of banks, no. of observations	32	987	32	987	32	987	32	987	32	987
Sargan test (2nd step; pvalue)		0.559		0.503		0.269		0.493		0.123
MA(1), MA(2) (p-value)	0.000	0.126	0.000	0.117	0.000	0.963	0.000	0.262	0.000	0.276

The model is as follows:

$$LLR_{it} = \beta_0 + \beta_1 LLR_{it-1} + \beta_2 NPL_{it-1} + \beta_3 INCOME_{it-1} + \beta_4 LTA_{it-1} + \beta_5 GDP_t + \beta_6 BUFFER_{it-1} + \beta_7 MONPOL_t + \beta_8 SIZE_t + \beta_9 REG_t + \Theta_t T_t + \pi_i \varepsilon_{it}$$

The model is given by the following equation, which includes interaction terms that are the product of the dummy variable WELL and LOW and GDP, NPL_{t-1} and LTA_{t-1}: with i=1,…, N and t=1, …, T and where: N = number of banks; LLR_{it}=loan loss reserves to total assets of bank i in quarter t; NPL_{it} = the change in the ratio of non-performing loans to total assets; GDP_{it} = nominal GDP; $SIZE_{it}$=log of total assets; INCOMEit-1=net earnings before taxes and provisions over total assets; $BUFFER_{it-1}$=excess capital to risk-weighted asset ratio; LTA_{it-1}=loans to total assets ratio; MONPOLt= the monetary policy rate; One lag has been introduced in order to obtain white noise residuals. The symbols *, **, and *** represent significance levels of 10 per cent, 5 per cent, and 1 per cent respectively.

Table 3. Correlation Matrix of Variables

Sample period: 2001-2009 (quarterly data)

	LLR	INCOME	LTA	SIZE	BUFFER	NPL	GDP
LLR	1.0000						
INCOME	0.0076 0.8111	1.0000					
LTA	0.0627 0.0488	0.1343* 0.0000	1.0000				
SIZE	0.1673* 0.0000	-0.0729 0.0220	-0.1380* 0.0000	1.0000			
BUFFER	-0.0891* 0.0051	0.2469* 0.0000	0.1148* 0.0003	-0.5268* 0.0000	1.0000		
NPL	0.1920* 0.0000	-0.3789* 0.0000	-0.0380 0.2327	0.1682* 0.0000	-0.2871* 0.0000	1.0000	
GDP	-0.0351 0.2707	0.0518 0.1043	-0.0570 0.0737	0.0414 0.1943	-0.0592 0.0630	-0.0518 0.1038	1.0000
MONPOL	-0.0161 0.6136	0.0664 0.0371	0.0059 0.8527	-0.1222* 0.0001	0.0686 0.0312	0.2012* 0.0000	0.0578 0.0695
CAP	-0.0891* 0.0051	0.2469* 0.0000	0.1148* 0.0003	-0.5268* 0.0000	1.0000* 0.0000	-0.2871* 0.0000	-0.0592 0.0630

	MONPOL	CAP
MONPOL	1.0000	
CAP	0.0686 0.0312	1.0000

***** indicates significance at the 1 percent level.

Table 4

Summary Statistics of Well-Capitalized banks and Low-Capitalized banks

Well-capitalized bank (90th percentile)

Variable	Obs	Mean	Std. Dev.	Min	Max
RISKWEIGHT	93	.442469	.1455503	.182692	.9242131
LLR	93	.0277355	.0526254	.0002781	.2226582
INCOME	93	.0110649	.0101482	-.0264676	.037996
LTA	93	.4072102	.149046	.1647681	.756734
NPL	93	.0079964	.0092064	0	.0272048
SIZE	93	23.19277	.5003844	22.29017	24.33084

.

Low-capitalized bank (10th percentile)

Variable	Obs	Mean	Std. Dev.	Min	Max
RISKWEIGHT	90	.6018642	.0529683	.5116453	.7980336
LLR	90	.056106	.0408916	.0121565	.1567476
INCOME	90	.0041816	.0037381	-.0141147	.0092885
LTA	90	.4467922	.0665405	.310615	.5763747
NPL	90	.0939416	.0658959	.0119546	.2714798
SIZE	90	25.90942	.9746135	23.68709	27.17644

.

Table 5. Sub-sample estimation of the model of determinants of loan loss reserves by Philippine banks

Dependent Variable: LLR_{it}

Estimation method: GMM, equation in first differences

Dependent variable: Loan-loss reserves to total assets LLR_t	(I) Below-average NPL		(II) Above-average NPL	
	Coeff.	S.Error	Coeff.	S.Error
1) Credit Risk				
LLR_{t-1}	0.655 ***	0.011	0.640 ***	0.014
NPL_{t-1}	0.334 ***	0.098	0.238 ***	0.021
LTA_{t-1}	0.011	0.010	0.027 ***	0.004
2) Bank Specific				
$SIZE_{t-1}$	-0.008 ***	0.002	0.000	0.002
$BUFFER_{t-1}$	-0.017 ***	0.005	0.002	0.018
$INCOME_{t-1}$	0.299 ***	0.102	0.276 *	0.145
3) Control/ Macro Variables				
GDP_t	-0.848 ***	0.137	-0.839 ***	0.103
$MONPOLR_t$	3.749 ***	0.301	3.060 ***	0.291
REG	0.066 ***	0.005	0.057 ***	0.004
Constant	-0.045	0.038	-0.226	0.044
Seasonal Dummies	yes		yes	
Sample period	2001-2009		2001-2009	
No. of banks, no. of observations	20	618	12	369
Sargan test (2nd step; pvalue)		0.780		0.755
MA(1), MA(2) (p-value)	0.000	0.142	0.000	0.321

References

Ahmed, A.S., Takeda, C. and S. Thomas, (1999). “Bank loan loss provisions: A re-examination of capital management, earnings management and signaling effects.” Journal of Accounting and Economics, vol 28, pp. 1-26.

Anandarajan, A., I. Hasan and C. McCarthy, (2006). “The use of loan loss provisions for capital management, earnings management and sginalling by Australian banks,” Bank of Finland Discussion paper, vol. 23, 2006

_____ and A. Lozano-Vivas (2003). “The role of loan loss provisions in earnings management, capital management, and sginalling: The Spanish experience”, Advances in International Accounting, 16, pp. 43-63.

Anklomkliew, S., J. George, and F. Packer, (2009). “Issues and developments in loan loss provisioning: the case of Asia,” BIS Quarterly Review, December.

Arellano, M. and S.R. Bond, (1991). “Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations.” Review of Economic Studies, vol 58, pp. 277-297.

Ayuso, J, D. Perez, and J. Saurina, (2002). “Are Capital Buffers Procyclical? Evidence from Spanish panel Data”, banco de España Working paterno. 0224.

Basel Committee for Banking Supervisions (BCBS) Report, April 2009

Beattie, V., P.D. Casson, R. Dale, G. McKenzie, C. Sutcliffe, and M. Turner, (1995). Banks and bad Debts: Accounting For Loan Losses in International Banking, Wiley Press, 1995.

Beatty, A. and S. Liao, (2009). “Regulatory capital, Loan Loss Provisioning and Pro-cyclicality”.

Beaver, William H. and Ellen E. Engel (1996), “Discretionary Behavior with Respect to Allowance for Loan Losses and the Behavior of Securities Prices”, Journal of Accounting and
Economics 22, pp. 177-206.

Berger, A.N., K.K. King, and S.M. O’Brien, (1991). “The limitations of market value accounting and a more realistic alternative”, Journal of Banking and Finance, vol. 15, pp. 753-783.

Bikker, J.A., H. Hu, 2002, “Cyclical patterns in profits, provisions and lending of banks and procyclicality of the new Basel capital requirements”, Banca Nazionale del Lavoro Quarterly Review 55, 143-175.

Bikker, J.A. and P.A.J. Metzemakers, 2004. “Bank Provisioning Behavior and Procyclicality”. Journal of International Financial Markets, Institutions and Money, vol. 15, pp. 141-157

Borio, C., C. Furfine, and C. Lowe, 2001. “Procyclicality of the Financial System and Financial Stability: Issues and Policy Options” BIS Papers no. 1, pp. 1-57.

Borio, C., and C. Lowe, 2001,”To provision or not to provision” BIS Quarterly review

Borio, C. I. Shim, 2007. “What can (macro-)prudential policy do to support monetary policy?” BIS Working Paper Series, No. 242, December 2007.

Bouvatier, V. and L. Lepetit, 2007. “Provisioning Rules and Bank Lending: A Theoretical Model”.

Bouvatier, V. and L. Lepetit, 2008. “Banks’ procyclical Behavior: Does provisioning matter?” Journal of International Financial Markets, Institutions and Money, vol. 18, pp. 513-526.

Bushman, R. and C. Williams, 2007.”Bank Transparency, Loan Loss Provisioning Behavior, and Risk-Shifting”, November 2007.

Calem, P. and Rob R., 1999, “The Impact of Capital-Based Regulation on Bank-Risk Taking”, Journal of Financial Intermediation, Vol. 8, pp. 317-52.

Caruana, J, 2005. “Monetary Policy, Financial Stability and Asset Prices”, Occasional Papers, 0507, Banco de España.

Collins, J.H., D.A. Shackelford and J.M. Wahlen, (1995). “Bank Differences in the Coordination of Regulatory Capital, Earnings, and Taxes”, Journal of Accounting Research, vo.33, no. 2 autumn, pp. 263-291.

Cortavarria,L, C. Dziobek, A.Kanaya, and I.Song, (2000), “Loan Review, Provisioning, and Macroeconomic Linkages”, IMF Working Paper, December 2000, WP/00/95

Craig, R., E. Philip Davis and A.G. Pascual, 2005, “Sources of Procyclicality in East Asian Financial Systems” Procyclicality of Financial Systems in Asia, Palgrave MacMillan Press, 2006

Dewatripont, M. and J. Tirole (1999), “The Prudential Regulation of Banks”, Cambridge, Mass.: MIT Press.

Dinamona, D.D., (2009). “Procyclical behavior of loan loss provisions and banking strategies: An application to European banks”, Risk Management and Value, World Scientific Studies in International Economics - Vol. 3 Feb 2008, eISBN: 9789812770745

Dugan, J., (2009). “Loan Loss Provisioning and Procyclicality”, Remarks during the Institute of International Bankers, March.

Eng, L. and S. Nabar, (2007). “Loan Loss Provisions by banks in Hongkong, Malaysia and Singapore”, Journal of International Financial Management and Accounting, 18:1, 2007.

Espenilla, N., (2005). “Risk Management in the Philippines”,

_____, (2009). “ Financial Regulation in the Philippines”, 60 years of Central Banking, BSP Press.

Fernandez de Lis, S., A. Garcia-Herrero (2009). “The Spanish Approach: Dynamic Provisioning and other Tools”, Towards a new Framework for Financial Stability, Central banking Publications, Ltd.

Fernandez de Lis, S. Martinez, and J. Saurina J., (2001). “Credit Growth, Problem Loans and Credit Risk Provisioning in Spain”, BIS Working Paper no. 1, pp. 331-353.

Fonseca, A.R. and F. Gonzalez, (2008). “Cross-Country Determinants of Bank Income Smoothing By managing Loan-Loss Provisions”, Journal of Banking and Finance, no. 32, pp. 217-228

Flannery, M.J., (1989). “Capital regulation and insured banks’ choice of individual default risks”, Journal of Monetary Economics, no. 24, pp. 235-258.

Freixas, X. and J.C. Rochet, 2008. Microecnomics of Banking, MIT Press, 2nd ed.

Fudenberg, D. and J. Tirole (1995). “A Theory of Income and Dividend Smoothing Based on Incumbency Rents”, Journal of Political Economy, vol. 103, No.1, pp.75-93.

Furfine, C., (2000). “Evidence on the response of US banks to changes in capital Requirements.” BIS Working paper no. 88.

Gambacorta, L., and U. Albertazzi, (2009). “Bank Profitability and the Business Cycle”, Journal of Financial Stability, 2009, doi:10.1016/j.jfs.2008.10.02

Gambacorta, L. and Mistrulli, (2004). “Does Bank Capital Affect Lending behavior? Journal of Financial Intermediation, September 2004, vol. 13, pp. 436-457.

Genotte, G., D. Pyle, (1991). “Capital controls and bank risk”, Journal of banking and Finance, no. 15, pp. 805-824.

Gertler, M. And S. Gilchrist, (1993). “Monetary policy, business cycles and the behaviour of small, manufacturing firms” Working paper, 93-02, C.V. Starr Center for Applied Economics, New York University.

Goel A., and A. Thakor, (2000). “Why do firms smooth earnings?” Journal of Business, vol. 76, No. 1, pp.151-192.

Ghosh, S., (2007). “Loan loss provisions, earnings, capital management and signalling: Evidence from Indian Banks”, Global Economic Review, vol. 36, no. 2, pp. 121-136, June.

Goldstein, M. (1998) The Asian Financial Crisis: Causes, Cures, and Systematic Implications, Institute of International Economics: Washington, DC., 77 pages, ISBN 0-88132-261-X

Gonzales, J. E. , (2009). “The Fundamentals of Procyclicality of the Financial System”, Bangko Sentral ng Pilipinas Economic Newsletter, No.09-03, July 2009.

Gorton, G. And R. Rosen, (1995). “Corporate control, portfolio choice and the decline of banking”. Journal of Finance, 13: pp. 883-991

Greenwalt and Sinkey, (1988).”Bank Loan-Loss Provisions and the Income-Smoothing Hypothesis: An Empirical Analysis, 1976-1984””, Journal of Financial Services Research, no.1, pp.301-318.

Greenwalt and Sinkey, (1991). “Loan loss experience and Risk-Taking Behavior at Large Commercial Banks”, Journal of Financial Services Research, no. 5, pp.43-59.

Guinigundo, D., 2005. “The Philippine Financial System: Issues and Challenges” BIS papers, no. 28, August 2006.

Hasan, I. and L. Wall, (2003). “Determinants of the Loan Loss Allowance: Some Cross-Country Comparisons”. Bank of Finland Discussion Papers No.33

Hoggarth, G. and D. Pain, (2002). “Bank Provisioning: the UK experience”, Financial Stability Review, Bank of England, June, pp. 116-127.

Jimenez, J., V.Salas, and J. Saurina, 2004, “Determinants of Collateral” Banco de España Working Paper,No. 0420

Jimenez, G. and J. Saurina, 2005. “Credit cycles, credit risk and prudential regulation”. International Journal of Central Banking, June 2006, v.2, iss. 2, pp.65-98

Jokipii, T. and A. Milne, (2009). “Bank capital buffer and risk adjustment decisions”, Swiss National Bank Working Paper, October.

Jordan, J. Peek, J. and E. Rosengren, 2002. “Credit risk modeling and the cyclicality of capital”

Kanagaretnam, K., J. Gerald and R. Matheiu, (2001). “Managerial incentives for income smoothing through bank loan-loss provisions”, Social Science Research Network Working Paper.

Kim M. and W. Kross, (1998). “The Impact of the 1989 change in bank capital standards on loan loss provisions and write-offs”, Journal of Accounting and Economics, 25,February pp.69-99.

Kim M. and A. Santomero, (1988). “Risk in banking and capital regulation”, Journal of Finance, no. no. 43, pp.1219-1233.

Kim M.and A. Santomero, (1993). “Forecasting Required Loan-Loss Reserves”, Journal of Economics and Business, vol. 45. pp.315-329.

Laeven, L. and G. Majnoni, (2003). “Loan Loss Provisioning and Economic Slowdowns: Too Much, Too late?” World Bank Policy Research Working Paper, no. 2749.

Li, G., (2009). “A Comparison of Loan Loss Allowance Practices in Asia”, Asia Focus Newsletter, Federal Reserve Bank of San Fransisco, June.

Lindquist, K., (2007). “Banks’ Buffer capital: How Important Is Risk” Journal of International Money and Finance 23 (3) (2004), pp. 493–513.

Lobo, G.J. and D. Yang (2001) “Bank Managers’ Heterogeneous Decisions on Discretionary Loan Loss Provisions”, Review of Quantitative Finance and Accounting, 16, pp. 223-250.

Liu, C., S. Ryan and J. Wahlen, (1997). “Differential Valuation Implications of Loan Loss Provisions Across banks and Fiscal Quarters”, The Accounting Review, vol. 72, no. 1, pp. 133-146.

Mann, F. and I. Michael, (2002). “Dynamic Provisioning: Issues and Applications“, Bank of England Financial Stability review, pp.128-136.

Mckenzie, G., (1995). “Loan Loss Reserves and Capital Buffers,” Social Science Research Network Working Paper.

Milne, A. and E. Whalley (2001). Bank Capital Regulation and Incentives for Risk-Taking. Via Internet http://papers.ssrn.com/sol3/papers.cfm?abstract_id=299319&download=yes

Merton, R.C., (1977), “An Analytic Derivation of the Cost Deposit Insurance and Loan Guarantees”, Journal of Banking and Finance, vol. 1, pp. 3-11.

Moyer, S.E., (1990), “Capital Adequacy Ratio Regulations and Accounting Choices in Commercial Banks”, Journal of Accounting and Economics, vol. 13, pp. 123-154.

Perez, D., and J. Saurina, (2002), “Are Capital Buffers Pro-Cyclical? Evidence from Spanish Panel Data”, Banco de España Working Paper No. 0224.

Perez, D., Salas-Fumas, V. and J. Saurina, (2006), “Earnings and Capital Management in Alternative Loan-Loss Provision Regulatory Regimes”. Banco de España Working Papers: 0614

Pinho, P. and N. Martins (2009). “Determinants of Portuguese Bank’s Provisioning Policies: Discretionary Behaviour of Generic and Specific Allowances”, Journal of Money, Investment and Banking ISSN 1450-288X Issue 10.

Podpiera, R. and R. Singh, (2007), “Credit Growth and bank balance Sheets in the Philippines”, IMF Selected Issues, May 2007.

Prenio, J., (2007), “Pro-cyclicality Impact of Basel II in the Philippines”, SEACEN 2007.

Ree, J., (2008), “Contagion of the Recent Global Financial Turmoil”, IMF Selected Issues: Philippines, December 2008.

Rime, B. (2001), “Capital Requirements and Bank Behavior: Empirical Evidence for Switzerland”. Journal of Banking and Finance, vol. 25, pp. 789-805.

Rochet, J.C., (1992), “Capital Requirements and the Behavior of Commercial Banks”, European Economic Review, vol. 36,pp. 1137-1178.

Saurina, J., (2009), “Dynamic Provisioning: The Experience of Spain” The World Bank Group Crisis Response Policy Note, No. 7, July 2009.

Saurina J., and C. Trucharte C., (2007), “An Assessment of Basel II Procyclicality in Mortgage Portfolios”. Journal of Financial Services Research, October 2007, v.32, iss 1-2, pp. 81-101

Shrieves, R.E. and D. Dahl, (2003). “Discretionary accounting and the behavior mof Japanese Banks under financial Distress”, Journal of Banking and Finance, vol. 27, pp. 1219-1243.

Stolz, S, (2007). Bank Capital and Risk-Taking: The Impact of Capital Regulation, Charter Value and the Business Cycle, Springer-Verlag Press, 2007.

Wahlen, J.M., (1994). “The Nature of Information in Commercial Bank in Loan Loss Reserves”, *The Accounting Review,* vol. 69, no.3, July, pp. 299-305.

Wall, L., and T.W. Koch, (2000). “Bank Loan-Loss Accounting: A Review of Theoretical and Empirical Evidence”, Federal Reserve Bank of Atlanta Economic Review, Second Quarter, pp.1-19.

Wetmore J. and J. Brick (1994) “Loan-Loss Provisions of Commercial Banks and Adequate Disclosure: A Note”, Journal of Economics and Business, 46, pp. 299-305.