Saibal Ghosh*

Provisioning, Bank Behavior and Financial Crisis: Evidence from GCC Banks

DOI 10.1515/rmeef-2015-0024

Published online February 9, 2016

Abstract: The debate on bank capital regulation has in recent years devoted specific attention to the role that bank loan loss provisions play as a part of the overall minimum capital regulatory framework. Using data for 1996–2011, we find evidence in favor of both capital management and signaling behavior by GCC banks. Islamic banks appear to engage less in such behavior as compared to their non-Islamic counterparts.

Keywords: GCC, banking, provisioning

1 Introduction

It is well acknowledged that banks are susceptible to business cycles. When economic growth is robust, demand for credit is strong and this makes banks aggressive to garner market share by loosening credit standards (Crockett 2001; Borio, Furfine, and Lowe 2001a, 2001b, 2001c). With business on the upturn, debtors are also able to service the loans.

However, when the business cycle turns adverse and economic conditions deteriorate, there is a significant worsening of borrowers' credit quality. This, in turn, increases the borrowers default probability in servicing their payment. These loans turn non-performing. As a result, banks' profits take a hit and at the same time, they need to set aside higher amounts as provisions for loan losses. Banks are therefore compelled to tighten their credit extension and restrict lending; the risks spill over to the real sector, exacerbating the already contractionary impact. Procyclicality thus has the effect of amplifying business cycles.

The relevance of this issue has persisted since the initiation of the first Basel Accord in 1988. On one side, it has been recognized that banks need to hold adequate capital in order to compensate for the risks they assume. As compared to this, the potential negative externalities of capital regulation are equally compelling: higher capital requirements can lead to a contraction in credit supply,

*Corresponding author: Saibal Ghosh, Reserve Bank of India, Mumbai, India 400 001,
E-mail: saibalghosh@rbi.org.in

especially during downturns when all institutions scramble to meet their capital standards to cover for the weaknesses of a deteriorating loan portfolio.

The recent financial crisis has added fresh impetus to this debate. The extended phase of robust economic growth amidst a benign economic environment increased incentives for banks to lend amidst expectations of higher returns, resulting in overvaluation of assets. As the downturn set in, the system went into reverse, leading to a downgrade of asset portfolios and increasing difficulties for banks to raise capital. As a result, banks were forced to disproportionately cut lending, leading to a credit crunch which amplified the severity of the downturn.

It has, therefore, been suggested that regulatory policies should focus on the pro-cyclicality of capital regulation. One policy that has received significant attention is loan loss provisions (LLPs). If banks set aside adequate buffers for potential impairment of loans, it appears likely that the adverse impact of a credit contraction on the real economy during downturns could be significantly lower. As a result, LLPs can be a useful countercyclical device to arrest bank fragility.

The treatment of LLPs in the accounting process however, varies significantly across countries. At the microeconomic level, such provisions can be utilized for both capital management and income smoothing. Wahlen (1994) and Collins, Shackelford, and Wahlen (1995), among others, provide evidence to suggest that banks use LLP to manage income. As compared to this, Moyer (1990) does not find evidence in favor of the income smoothing. In a similar vein, several studies show that LLPs act as a signaling device (Wahlen 1994). As compared to this, Ahmed, Takeda, and Thomas (1999) find no evidence in favor of the signaling hypothesis.

Given this conflicting evidence across countries, it remains a moot issue as to how far such facts are relevant for GCC countries. In this context, combining bank level data on GCC countries along with macro variables, the paper investigates the underlying motive behind the use of LLPs by banks.

Besides this central question, our analysis supplements the literature on this issue in two other directions. First, we examine the behavior of provisioning over an extended time span that includes the financial crisis. This enables us to examine whether the behavior of provisions differs during crisis and tranquil periods. Second, we also explore whether the provisioning behavior of Islamic banks differs from their non-Islamic counterparts. Although there are some studies on this aspect for GCC (Zoubi and Al-Khazali 2007) and Islamic (Taktak, Zouari, and Boudriga 2010) banks, the present article improves upon previous research by using advanced panel data techniques encompassing longer time frame. This allows us to take into account the endogeneity issues. To the best of our knowledge, this is of the few studies for GCC countries to examine this issue in a comprehensive fashion.

The GCC banking system provides a compelling case to examine this issue. These countries are predominantly exporters of hydrocarbon and its derivative products: on average, hydrocarbon accounts for a preponderant share of the region's GDP and makes the most significant contribution to both their exports and government revenues. The high and rising oil prices during the pre-crisis years fomented significant economic activity in these countries, with real GDP growth averaging close to 7% during 2003–2008 as compared to roughly half the number during the preceding five-year period. At the same time, these countries have been making conscious efforts to diversify their economies, moving away from hydrocarbon dominance and toward other (service and industry) sectors. The net effect of these efforts was manifest in improved non-oil GDP growth, which averaged nearly 7.5% during this period (IMF 2010a, 2010b, 2011).

The rest of the paper continues as follows. We briefly highlight the relevant literature in what follows (Section 2). This is followed by a discussion of GCC banks. Contextually, we also highlight the evolution of prudential norms in these countries. Thereafter, we describe the database and the empirical strategy. The penultimate section discusses the results including robustness checks, while the final section concludes.

2 Overview of Literature

This section discusses the theories that emphasize the incentives of bank managers to employ LLP as a management tool.

2.1 Loan Loss Provisions and Capital Management

There are several reasons why banks hold capital. First, capital levels minimize the probability of going bankrupt and consequently, the costs of failure. These include not only regulatory (e. g., restrictions on the current activities, future growth prospects, dividend payments) but also financial (e. g., it acts as a signal of creditworthiness and thereby lowers interest outgo) costs. Second, higher capital may bring advantages of future growth opportunities. For example, faced with a substantial increase in loan demand, banks with low levels of capital are more likely to lose their market share to well-capitalized ones (Jokipii and Milne 2008). Finally, higher capital levels might induce banks to screen borrowers more carefully, thereby raising the probability of repayment and in turn, lowering borrowing costs (Agenor, Alper, and de Silva 2012).

Altering the levels of capital entail adjustment costs. In addition to transaction costs, these include those related to informational asymmetries. Since the issuer is at an informational advantage as compared to potential buyers, stock issuance provides credible signal of the bank's capital, which in turn, lowers the adjustment costs. In this context, the effect of income smoothing on regulatory capital might compel banks to condition smoothing to meeting capital requirements.

More recently, Bouvatier and Lepetit (2012) have provided an explanation for the role of capital buffers in loan loss provisioning. According to the authors, capital buffers cover for expected losses over and above those not covered by LLPs. In order to build such buffers, banks use their retained earnings to increase capitalization during economic upturns, thereby negating the impact of the business cycle on provisions.

2.2 Loan Loss Provisions and Earnings Management

The idea behind earnings management is that banks adjust their provisioning behavior in order to manage their capital ratios (Kim and Cross 1998; Beatty, Chamberlain, and Magliolo 1995). The advantage of such capital management is based on two considerations. First, it acts as a signal of high quality to outside investors because it indicates stability of the bank's income (Barth 2001). When earnings are unusually low, banks can deliberately understate their LLPs or can release LLPs to offset operational losses; reverse is the case when earnings are unusually high. Several empirical studies have confirmed that such behavior is indeed observed in practice (Wahlen 1994; Laeven and Majnoni 2003; Liu and Ryan 2006; Bushman and Williams, 2012).

The second rationale behind LLPs is that higher provisioning when banks have low capital is suggestive of the fact that these two are substitutable buffers against potential losses. Although there are studies which provide evidence of such interlinkage (Ahmed, Takeda, and Thomas 1999; Bikker and Metzmakers 2005), there is also research that does not uncover any such discernible relationship (Bishop 1996; Collins, Shackelford, and Wahlen 1995).

Several studies have explored which bank characteristics matter for earnings management. Greenawalt and Sinkey (1988) and Bhat (1996) show that banks in the US use LLPs to smooth income. In contrast, Beatty, Chamberlain, and Magliolo (1995) find that US banks use miscellaneous gains to manage earnings. In case of Spanish banks, Perez, Salas, and Saurina (2006) uncover evidence that banks practice income smoothing, although evidence in favor of banks using LLPs to manage capital is less compelling.

Finally, Fonseca and Gonzalez (2008) show that banks in more developed financial systems are more inclined to smooth earnings. In particular, they show that income smoothing is negatively related to investor protection and accounting disclosure.

2.3 Loan Loss Provisions and Signaling

The use of LLPs as a signaling device has also attracted significant attention. Several studies find that bank managers use discretionary components of provisions to signal private information about the banks' future prospects. By way of example, Beaver et al. (1989) contend that investors interpret an unexpected increase in LLPs as a signal of the bank's financial strength. Yet others (Musumeci and Sinkey 1990; Griffin and Wallach 1991) find that capital markets respond positively to increases in LLPs, because it signals the growing creditworthiness of the bank. This evidence of a positive market reaction to unexpected increases in LLPs has also been echoed in several other studies (Liu, Ryan, and Wahlen 1997; Beaver and Engel 1996). This contrasts with the findings of Ahmed, Takeda, and Thomas (1999) and Anandarajan, Hasan, and McCarthy (2007) who do not find evidence in favor of signaling behavior by banks in their studies. More generally, Bushman and Williams (2012) show that market discipline over bank risk-taking is typically weaker in countries with less timely loss provisioning regimes, highlighting the adverse effects of manipulating financial statements by banks.

We build on these studies by examining the LLP policy of banks across an extended time period that includes the recent economic crisis. Besides income smoothing, we also examine the capital management and signaling hypotheses, an aspect not previously explored for GCC banks. Contextually, we also examine whether the provisioning behavior of Islamic banks differs from that of commercial banks.

3 Evolution of Provisioning Norms in GCC Economies

The financial sector in the GCC countries is generally bank based with bank asset to GDP ranging from less than 100% (as in Oman and Saudi Arabia) to over 300% (as in Bahrain). The presence of Islamic banks is a prominent feature of this region, accounting for around 20–25% of the banking system in most (except Oman, where it has started recently) countries. Bank concentration

Table 1: Indicators of banking development in GCC countries – 2011.

Country	Total commercial banks	Of which: Islamic	Of which: Foreign	Bank asset/ GDP	Concentration	Return on asset	Cost income ratio	Net interest margin
Bahrain	30	6	15	0.96	0.891	0.012	0.373	0.021
Kuwait	16	3	7	0.56	0.889	0.015	0.306	0.031
Oman	16	1	9	0.42	0.704	0.014	0.483	0.035
Qatar	16	4	7	0.71	0.869	0.027	0.235	0.033
Saudi Arabia	18	3	6	0.48	0.553	0.019	0.373	0.028
UAE	32	6	10	0.78	0.609	0.015	0.678	0.032

Source: World Bank 2013 (Financial Structure database), Al Hassan, Khamis, and Oulidi (2010), IMF (Regional Economic Outlook) and central bank websites.

remains high, with the assets of the three largest (usually, domestic) banks comprising between half to over 80% of total banking assets (Table 1).

In terms of ownership, the banking sector is preponderantly domestically owned, reflecting barriers to entry and licensing restrictions on foreign banks (Al Hassan, Khamis, and Oulidi 2010). As a result, the presence of GCC banks across borders is primarily in the form of branches, often of unitary nature. Public ownership of banks (comprising government, quasi government and domestic royal family) is high in several countries (UAE, Saudi Arabia and Oman), although in others (Bahrain, Kuwait and Qatar), it is much lower (Al Hassan, Khamis, and Oulidi 2010).

The rapid credit growth in the run-up to the crisis has been a mixed blessing. On the one hand, it has improved financial penetration, thereby ensuring the flow of credit to productive sectors. On the flip side, given the limited size of domestic markets, this has translated into increased concentration risk, either in the form of larger exposures to traditional corporate clients or in the form of sectoral concentration (IMF 2010). Not surprisingly, non-performing loans (NPLs) of most banking systems in the region have trended upwards in the wake of the crisis, in turn, impacting their profitability.¹ Following the crisis however, growth has slumped, especially in Bahrain, Kuwait and UAE, reflecting a combination of general and country-specific, including among others, slowdown in oil demand, Arab spring and Dubai World episode (IMF 2013).

As a result of these developments, banks in the region had to increase their provisions. Banks have accordingly adopted the financial accounting rules established by the International Accounting Standards Board (IASB), although

¹ Based on IMF (2013) data for the period 2006–2011, the correlation between RoA and NPLs for the GCC countries is found to be -0.492 (p -Value = 0.02)

there are certain differences across countries (Hussain et al. 2002). As per these standards, banks need to disclose, among others, the movements in the provisions for losses on loans and advances during the period as well as the aggregate amount of the provisions for losses on loans and advances on the balance sheet date.

As it stands at present, the loan loss provisioning norms in GCC are based on international best practices, with certain country-level variations (Table 2). Specific and general provisions for loan losses are made on the basis of a continuous appraisal of the lending portfolio in most cases, keeping in view the historical experience and current economic situation. Some countries (Kuwait and UAE) also have an in-between category between standard and sub-standard loans (labeled as “special mention” in case of Kuwait and “watch-list” in case of UAE), provisioning for which is at the discretion of management (e. g., Kuwait) or not warranting any provisioning at all (e. g., UAE). Specific provision for impaired loan varies from 20–50% depending on the periodicity of loan non-performance; in case of doubtful and loss loan categories, provisions are 50–100%. Most countries also have a system of general provisions, ranging from 1–2%, with exceptions being allowed for government loans (as in Qatar) as well as differential (general) provisions for personal and non-personal loans (as in Oman).

4 Database and Sample

The analysis employs a bank-level dataset, comprising of balance sheet and income statement details as published by *Bankscope*, maintained by International Credit Analysis Limited (IBCA). Using this database, Haselman et al (2010) show that changes in collateral laws exerted a significant influence on credit supply by banks in Eastern Europe.

We use a sample comprising of an unbalanced panel of annual report data from 1996 to 2011 for the GCC banking system, comprising commercial and Islamic banks. The sample initially comprised of nearly 120 banks. Subsequently, several banks were excluded. First, this included the finance and investment companies, whose balance sheet structure and regulatory dispensation are different from those of banks. In addition, we also excluded banks with missing data on the dependent variables. After this filtering, we were left with observations on 100 banks. With an average of 8.5 years of observations per bank, there were a maximum of 859 bank-years. To moderate the influence of outliers, we winsorized the top and bottom 1% of observations for all variables. The Appendix provides the variable definitions, including data source and summary statistics.

Table 2: Loan loss provisioning practices by GCC banks.

No	Item	Bahrain	Kuwait	Oman	Qatar	Saudi Arabia	UAE
1	Formal definition of non-performing loans	Yes	Yes	Yes	Yes	No	Yes
2	Primary system for loan classification (number of days)	Yes	Yes		Yes	Yes	
	Special mention/ watch list	...	Yes	...	...	...	Yes
	Sub-standard	Assessment	90–180	180–270 (Personal loans only)	90	None specified	90
	Doubtful	Assessment	181–365	271–365 (Personal loans only)	91–365	None specified	180
	Loss	Assessment	Above 365	Above 365	Above 365	None specified	365
3	Minimum provisioning requirements for loans (%)						
	Sub-standard	20	20	25	5–25	None specified	0–30
	Doubtful	50	50	50	25–60	None specified	31–70
	Loss	100	100	100	60–100	None specified	71–100
4	General provisions	Yes	Yes	Yes	Yes	Yes	Yes
	Amount (percent)	...	2 (for regular credit facilities, both cash and non-cash)	2 (outstanding performing personal loans)1 (outstanding performing other loans)	Not less than 2.5% of direct credit facilities, except credit facilities granted to government	...	1.5% of RWA (as per Basel II)

Notes: “...” not reported/ not available.

Source: World Bank (2012) based on Bank Regulation and Supervision Survey and respective central bank websites.

5 Econometric Specification

5.1 Univariate Tests

Table 3 enlists the LLPs and loan loss reserves (LLRs) for these banks, classified according to ownership (Panel A), country (Panel B) and by crisis period (Panel C). From the table, it appears that Islamic banks have higher LLPs as compared to Islamic banks, although the difference is not statistically significant. LLRs of commercial banks, on the other hand, are statistically and significantly higher as compared to Islamic banks.

Table 3: Loan loss reserves and loan loss provisions across various characteristics.

Variables	LLP	N.Obs	LLR	N.Obs
Panel A: Ownership				
Commercial	0.0048 (0.009)	738	0.0394 (0.049)	738
Islamic	0.0055 (0.014)	337	0.0176 (0.022)	337
<i>t-test for difference</i>	−0.838		10.138***	
Panel B: Country				
Bahrain	0.0058 (0.017)	243	0.030 (0.047)	243
Kuwait	0.0057 (0.011)	141	0.031 (0.025)	141
Oman	0.0056 (0.012)	80	0.048 (0.034)	80
Qatar	0.0042 (0.007)	115	0.036 (0.049)	115
Saudi Arabia	0.0038 (0.006)	173	0.029 (0.034)	173
United Arab Emirates (UAE)	0.0048 (0.006)	323	0.037 (0.049)	323
<i>t-test for difference</i>				
Bahrain v. Kuwait	0.069		2.276**	
Bahrain v. Oman	0.116		−5.153***	
Bahrain v. Qatar	1.251		−2.319**	
Bahrain v. Saudi Arabia	1.639		−1.708*	
Bahrain v. UAE	0.857		−3.494***	
Kuwait v. Oman	0.063		−3.834***	
Kuwait v. Qatar	1.368		−0.859	
Kuwait v. Saudi Arabia	1.855*		0.485	

(continued)

Table 3: (continued)

Variables	LLP	N.Obs	LLR	N.Obs
Kuwait v. UAE	0.935		-1.702*	
Oman v. Qatar	0.966		2.077**	
Oman v. Saudi Arabia	1.289		3.978***	
Oman v. UAE	0.592		2.278**	
Qatar v. Saudi Arabia	0.505		1.133	
Qatar v. UAE	-0.844		-0.301	
Saudi Arabia v. UAE	-1.686*		-1.997**	
Panel C: Crisis				
Non-crisis	0.0049 (0.011)	975	0.034 (0.044)	975
Crisis (2009)	0.0057 (0.013)	100	0.024 (0.030)	100
<i>t-test for difference</i>	-1.703*		3.013***	

Note: Standard deviation within parentheses.

***, ** and * denotes statistical significance at 1, 5 and 10%, respectively.

The country-level tabulations suggest significant differences in terms of LLRs, although the variation in terms of LLPs is not so compelling. Banks in Oman and UAE are observed to have the highest levels of LLRs, whereas banks in Bahrain have the lowest LLRs, on average, reflecting in part, the economic weaknesses in the aftermath of the crisis and the Arab spring. LLRs for banks in Bahrain, for example, average around 3.0% of assets are compared to 4.8% for Omani banks. This difference is statistically significant at the 0.01 level. In several other instances and especially for Omani banks, these differences are statistically significant.

Banks also improved their LLPs, especially during the crisis. As Table 3 reveals, LLPs were roughly 0.49% of banks' assets during non-crisis times. During the crisis, this improved to 0.57%. The difference vis-à-vis non-crisis period is statistically significant. On the other hand, LLRs appeared to have declined during the crisis, consistent with the fact that a rise in NPLs in the region more generally has impelled banks to draw down on their reserves as provisions against delinquent loans.

The correlation matrix in Table 4 indicates that bigger and profitable banks tend to have lower levels LLRs. At the macroeconomic level, higher GDP growth prompts banks to cut back on their LLPs, suggestive of countercyclical behavior. These raw correlations however, do not take on board either bank-specific or business cycle considerations.

Table 4: Correlation matrix of major explanatory variables.

Variables	LLP	LLR	LTA	Equity/Asset	EBTA	NPLs	Ch_loan	GDPGR	DEPRT	ISLAMIC	CRISIS
LLP											
LLR	0.177***										
LTA	-0.036	-0.149***									
Equity/Asset	-0.012	-0.156***	-0.577***								
EBTA	-0.236***	-0.050***	0.013	0.052*							
NPLs	0.217***	0.516***	-0.049**	0.031	-0.163***						
Ch_loan	-0.214***	-0.107***	0.038	0.002	0.279***	-0.303***					
GDPGR	-0.129***	-0.002	-0.049	-0.048*	0.160***	-0.066***	0.157***				
DEPRT	0.051*	0.156***	-0.102***	-0.144***	-0.022	0.040***	-0.166***	-0.313***			
ISLAMIC	0.030	-0.234***	-0.337***	0.153***	-0.022	-0.273***	0.053*	-0.012	0.031		
CRISIS	-0.019	-0.067**	0.062**	0.149***	-0.059**	0.012	0.056*	-0.225***	-0.049**	0.002	

***, ** and * denote statistical significance at 1, 5 and 10%, respectively.

The univariate results discussed earlier provide evidence in support of differences across country-bank pairs in terms of their LLRs (and to an extent, LLPs as well). The subsequent correlation analysis also points in a similar direction. As well, the results are suggestive of a countercyclical approach on part of banks in their provisioning behavior. These tests however, do not consider several bank-specific variables. For instance, provisioning of large banks could be different from those which are relatively small by size. The macroeconomic environment could also be a relevant consideration. Taking these observations into account, we employ a multivariate regression framework to test the several hypotheses relating to capital management, earnings smoothing and signaling.

5.2 Testing for Capital and Earnings Management

To test for these hypotheses, the empirical specification for bank s in country j at time t is assumed to be of the following form:

$$\begin{aligned} Dep\ var_{s,j,t} = & \varphi_1 LDV_{s,j,t-1} + \varphi_2 (Equity/Asset) + \varphi_3 EBTP_{s,j,t} \\ & + \varphi_4 Islamic_{s,j,t} * EBTP_{s,j,t} + \varphi_5 [Bank\ level\ controls]_{s,j,t} \\ & + \varphi_6 [Banking\ industry\ controls]_{j,t} + \varphi_7 [Macro]_{j,t} + \varphi_8 [Dummies]_{j,t} \\ & + v_s + \varepsilon_{s,j,t} \end{aligned} \quad (1)$$

where the φ s' are the parameters to be estimated.

5.3 Dependent Variable

Following from the literature, we employ two measures of the dependent variable (*Depvar*), depending on whether the information on provisions has been extracted from banks' balance sheet or the income statement.

Consistent with prior research (Ahmed, Takeda, and Thomas 1999; Laeven and Majnoni 2003; Bikker and Metzmakers 2005; Bouvatier and Lepetit 2008), the first dependent variable is the ratio of loan loss provisions to total asset (LLP).

Following Grammatikos and Saunders (1990) and Walter (1991), the alternate dependent variable is the ratio of loan loss reserves divided by bank asset (LLR). This variable represents the global amount of provision for loan losses built up by the bank.

In other words, a LLP is a “shock absorber” to offset expected future losses (Laeven and Majnoni 2003), whereas a LLR is the amount of principal that is not expected to be recovered.

5.4 Independent Variables

The evolution of provisions is linked to the past due age of non-performing loans. Therefore, it seems reasonable to expect that LLPs will be correlated across years. As a result, we include the lagged-dependent variable (LDV).

The variable *Equity/Asset* identifies whether bank capital plays a role in influencing provisions. It is well-acknowledged that banks try to manage regulatory capital upwards via abnormal LLPs that increase LLPs, so as to convey an impression of financial health to regulators. Provided that tier-II capital is augmented via opportunistic increases in LLPs, a negative coefficient will imply capital management.

The ratio of earnings before taxes and provisions to total assets (EBTP) tests for income smoothing (Ahmed, Takeda, and Thomas 1999). If banks have earnings lower (resp., higher) than their target value, they will tend to lower (resp., raise) LLPs to stabilize them. In other words, a positive coefficient on EBTP would lend support to this hypothesis. The interaction variable – *Islamic*EBTP* – is incorporated to detect the differential earnings stabilization policy for Islamic banks. Cross national research by Taktak, Zouari, and Boudriga (2010) posits a positive coefficient on this variable.

Following from the literature (Hasan and Wall 2004), we control for the non-discretionary component of LLPs by including the non-performing loan ratio (NPLs).

Change in loans can be considered as a proxy for general provisions. The influence of this variable on LLPs depends largely on the quality of *incremental* loans (Lobo and Yang 2001).

Finally, we control for bank size by including the logarithm of bank asset (LTA). *A priori*, one would expect a positive sign on this variable, based on the conjecture that bigger banks have larger business volumes and consequently, more likely to have higher LLPs (Anandarajan, Hasan, and McCarthy 2007).

At the industry level, we control for overall financial development (proxied by bank credit to GDP), with an expected positive sign (Fonseca and Gonzalez 2008). We also include a proxy for concentration (measured as the asset share of three largest banks). The effect of concentration on LLPs is not clear, *a priori*. On the one hand, the “concentration-fragility” view would suggest that increase in banking concentration tends to engender high banking fragility (De Nicolo et al. 2004).

On the other hand, the “concentration-stability” view contends that an increase in banking concentration does not result in higher banking fragility (Beck, Demirgüç Kunt, and Levine 2006a, 2006b).

At the macroeconomic level, we include real non-oil GDP growth (GDPGR).² Since repayments are higher in upturns, banks need to provide less for loan losses, entailing a positive sign on this variable. Besides, we capture the stance of monetary policy by including the real interest rate (RoI). Higher rates of interest raise funding costs for borrowers, in turn, raising the repayment burden, and thereby, compelling banks to raise provisions. As a result, the expected sign on this variable is positive. The variable ν captures bank characteristics that are unobservable and finally, ε is the error term.

We also include several dummy variables. The first dummy – *Crisis* – takes into account the recent financial crisis. As our prior discussion observes, banks’ NPLs have witnessed an upturn in the aftermath of the crisis, which would suggest the need for higher provisioning, with an expected positive sign on this variable. Second, we include a dummy which equals one if a bank is Islamic. To the extent that Islamic banks have been impacted relatively less by the crisis as compared to commercial banks (Akhtar Aziz 2009), it seems likely that they would need to make lower provisions. We also include country dummies to control for unobservable, country-specific factors such as the level of development, geography and institutions.

5.5 Testing for Signaling Hypothesis

In order to examine the signaling model, we include the one-year ahead change in earnings before taxes and provisions ($\Delta EFTP_{s,t+1}$) in the regression equation. Besides, we rationalize the equation by excluding NPLs and change in loans from the set of independent variables. Accordingly, the revised empirical specification for bank s in country j at time t reads as follows:

$$\begin{aligned} Dep\ var_{s,j,t} = & \eta_1 LDV_{s,j,t-1} + \eta_2 (Equity/Asset) + \eta_3 EFTP_{s,j,t} + \eta_4 \Delta EFTP_{s,j,t+1} \\ & + \eta_5 Islamic_{s,j,t} * \Delta EFTP_{s,j,t} + \eta_6 [Bank\ level\ controls]_{s,j,t} \\ & + \eta_7 [Banking\ industry\ controls]_{j,t} + \eta_8 [Macro]_{j,t} + \eta_9 [Dummies]_{j,t} \\ & + \lambda_s + \mu_{s,j,t} \end{aligned} \quad [2]$$

² In case of GCC countries, non-oil GDP is the more relevant metric to measure job creating economic activity (IMF 2010).

where the notations are the same as earlier and η_s' are the parameters to be estimated.

As per the signaling hypothesis, discretionary changes in LLPs are positively correlated with changes in future earnings. This would suggest that, for the signaling hypothesis to be valid, the coefficient on η_4 would be positive, consistent with previous studies (Ahmed, Takeda, and Thomas 1999; Anandarajan, Hasan, and McCarthy 2007).

6 Results and Discussion

6.1 Results for the Capital Management and Income Smoothing Hypotheses

The inclusion lagged dependent variable would suggest that the standard OLS estimation process is not consistent. To circumvent this problem, we resort to the Generalized Method of Moments (GMM) estimator.

The reliability of the GMM estimation procedure depends on the validity of the instruments. To do this, we present the Sargan test of over-identifying restrictions, which asymptotically follows a χ^2 distribution. The higher the p-value, the more likely it is that the chosen instruments are valid.

In addition, the estimates also need to ensure the absence of serial correlation in the error terms. To do this, we present tests for first-order (AR1) and second-order (AR2) serial correlation. Statistically, a low p-value for AR1 and a high p-value for AR2 would suggest that the disturbances are not serially correlated.

The regression results are presented in Table 5. The Sargan test statistic provides strong evidence in favor of validity of the instruments. Similarly, the reported AR values suggest the absence of second-order autocorrelation in the residuals. Taken together, these tests support the fact that the model specification is appropriate.

The lagged dependent variable (LDV) is positive and significant at the 1% level. This indicates that LLPs display high levels of persistence, conforming to *a priori* expectations (Bouvatier and Lepetit 2008; Fonseca and Gonzalez 2008).

We first briefly discuss the bank-level controls and banking industry variables. The coefficient on bank size is negative and significant in the LLR equation (Models 1–5), but does not appear to be significant in the LLP results (Models 6–10). In other words, a 10% increase in total assets lowers LLRs by roughly 0.3%. This implies that bigger (and hence, more diversified) banks are not able to adequately reduce risk exposures as compared to smaller banks. NPLs bear a positive sign across all LLP specifications, which suggest that banks

Table 5: Determinants of loan loss provisions – Tests of earnings and income smoothing hypotheses.

Variables	Dependent variable = LLP					Dependent variable = LLR				
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10
Constant	0.0002* (0.0001)	0.0002*** (0.0001)	0.0006*** (0.0001)	0.0002** (0.0001)	0.0004*** (0.0001)	-0.0008*** (0.0001)	-0.0007*** (0.0001)	-0.0004*** (0.0001)	-0.0006*** (0.0001)	-0.0006*** (0.0001)
LDV	0.089*** (0.003)	0.095*** (0.004)	0.100*** (0.005)	0.088*** (0.003)	0.078*** (0.006)	0.689*** (0.011)	0.686*** (0.010)	0.696*** (0.012)	0.692*** (0.012)	0.708*** (0.012)
Concentration	0.006** (0.003)	0.006*** (0.003)	0.001 (0.004)	0.005 (0.003)	0.008*** (0.003)	-0.053*** (0.007)	-0.055*** (0.006)	-0.059*** (0.007)	-0.049*** (0.007)	-0.055*** (0.007)
Fin. development	-0.001 (0.001)	-0.002* (0.001)	-0.0004 (0.0006)	-0.001 (0.001)	-0.002 (0.001)	0.032*** (0.001)	0.032*** (0.002)	0.035*** (0.001)	0.030*** (0.002)	0.031*** (0.002)
DEPRT	0.023*** (0.003)	0.023*** (0.004)	0.022*** (0.004)	0.024*** (0.003)	0.023*** (0.004)	0.016*** (0.005)	0.019*** (0.005)	0.020*** (0.005)	0.021*** (0.005)	0.019*** (0.006)
LTA	0.001 (0.001)	0.001 (0.001)	-0.006*** (0.0009)	0.001 (0.001)	-0.001 (0.001)	-0.034*** (0.002)	-0.034*** (0.002)	-0.040*** (0.003)	-0.034*** (0.002)	-0.034*** (0.002)
NPLs	0.036*** (0.001)	0.035*** (0.001)	0.013*** (0.001)	0.037*** (0.001)	0.035*** (0.001)	-0.139*** (0.006)	-0.140*** (0.005)	-0.179*** (0.007)	-0.144*** (0.006)	-0.147*** (0.006)
Ch_loan	-0.001* (0.0006)	-0.001*** (0.0006)	-0.006*** (0.0005)	-0.001* (0.0006)	-0.001* (0.007)	-0.036*** (0.002)	-0.038*** (0.002)	-0.042*** (0.003)	-0.037*** (0.002)	-0.036*** (0.002)
Equity/Asset	0.0001 (0.002)	-0.0004*** (0.002)	-0.021*** (0.002)	-0.0007 (0.002)	-0.099*** (0.005)	-0.047*** (0.006)	-0.048*** (0.007)	-0.012* (0.006)	-0.046*** (0.006)	-0.140*** (0.007)
EBTA	-0.106*** (0.002)	-0.106*** (0.003)	-0.523*** (0.018)	-0.106*** (0.002)	-0.092*** (0.004)	0.002 (0.013)	0.0004 (0.013)	-0.561*** (0.023)	0.003 (0.013)	-0.005 (0.013)
ISLAMIC	-0.0007*** (0.0001)	-0.0009*** (0.0002)	0.0008*** (0.0001)	-0.0008*** (0.0001)	-0.0003 (0.0002)	-0.001*** (0.003)	-0.001*** (0.003)	0.0007*** (0.003)	-0.0009*** (0.003)	-0.0004 (0.003)
CRISIS	0.0003 (0.001)	-0.0002 (0.0003)	-0.001** (0.0005)	-0.001 (0.0005)	0.0001 (0.0006)	0.004*** (0.0007)	0.003*** (0.0007)	0.0008 (0.0007)	0.002*** (0.0007)	0.004*** (0.0007)
GDPGR	-0.007*** (0.002)	-0.002* (0.001)	-0.004*** (0.001)	-0.008*** (0.002)	-0.002 (0.002)	-0.018*** (0.004)	0.0006 (0.004)	-0.016*** (0.005)	-0.018*** (0.004)	-0.014*** (0.004)

[illegible]

Standard errors in parentheses.

****, ** and * denote statistical significance at 1, 5 and 10%, respectively. m1 and m2 are the first- and second -order residual autocorrelation.

provisions are higher when their loan losses increase. On the other hand, LRR bears a uniformly negative coefficient in all models, which suggests that banks tend to draw down reserves when NPLs rise. The coefficient on loan growth is negative and strongly significant, reflective of the fact that risks tend to accumulate during economic booms (Borio et al. 2001; Lowe 2003; Bikker and Metzmakers 2005). A 10% increase in loans lowers LLRs by roughly 0.4%; LLPs likewise, decline by 0.01–0.06%.

At the banking industry level, the coefficient on *concentration* is positive in the LLP specification, supportive of the “concentration-stability” views of Beck et al. (2006a). The coefficient on *financial development* is positive in LLP specification, as expected, but negative in the LLP model, indicating that greater penetration of finance impels banks to cut back provisions. The positive sign on the interest rate variable is consistent with the “financial instability hypothesis” (Minsky 1975), which suggests that higher short-term interest rates increases borrower indebtedness and exacerbates financial fragility thereby prompting an increase in loan losses.

The first variable of interest – *Equity/Asset* – bears a negative association with provisions. This is in line with the capital management hypothesis which predicts higher provisioning when the capital ratio is low. The results are akin to those reported for US banks (Beatty, Chamberlain, and Magliolo 1995; Ahmed, Takeda, and Thomas 1999). The marginal effect of capital on provisioning and is –0.38, similar to the magnitudes obtained in previous studies (Bikker and Metzmakers 2005).

The second variable of interest – *EBTP* – has a negative and significant coefficient in the LLP specification (Model 6). The elasticity of LLPs with respect to *EBTP*, evaluated at the mean values, equals –0.43. In other words, a proportionate increase in *EBTP* by 1% would induce a proportionate decline in LLPs by roughly 0.4%. These results concur with Laeven and Majnoni (2003) for Asian banks. More recently cross-country studies also find similar results for certain countries (Fonseca and Gonzalez 2008; Packer and Zhu 2012).³

The GDPGR variable is negative and significant. This confirms the existence of a strong cyclicity of provisions in the GCC banking system, indicating that provisions rise when economic growth is weak. The elasticity of LLPs with respect to GDP growth varies across countries, ranging from –0.07 for Saudi Arabia to a high of –0.16 in case of Qatar: an increase in GDP by 10% would lower LLPs by 0.07–0.16%. This evidence is consistent with pro-cyclical

³ Based on their study on income smoothing for banks in 40 countries for 1995–2002, Fonseca and Gonzalez (2008) find evidence in contrary to the income smoothing hypothesis for six countries in their sample (Colombia, Greece, Malaysia, Pakistan, Thailand and the United Kingdom). None of the GCC countries was part of their sample.

behavior by banks, as already reported in prior empirical research (Fonseca and Gonzalez 2008; Bikker and Metzmakers 2005; Laeven and Majnoni 2003).

6.2 Capital Management and Income Smoothing: Robustness

We extend the baseline regression to examine certain additional hypotheses. Following from the literature, we focus on the results with LLPs as the dependent variable; the results pertaining to LLRs are qualitatively similar.

First, we examine whether Islamic banks tend to exhibit higher provisions in an upswing as compared to commercial banks. In Model 2, the coefficient on $GDPGR*ISLAMIC$ is negative and significant with a point estimate equal to 0.021. To consider the overall impact, consider a country with a GDP growth equal to 6%, the median growth in the sample. Temporarily ignoring the Islamic bank effect, this would suggest that a rise in GDP by 10% would lower LLPs by 0.01%. Taking into consideration the Islamic bank, the point estimates in Model (2) provide a magnitude roughly 0.032% points. In other words, Islamic banks appear to make lower provisioning in upswings.

In Model (3), we examine the earnings smoothing hypothesis for Islamic banks. The estimates reveal that the interactive term has a magnitude equal to 0.041, which is positive and statistically significant. In other words, Islamic banks do not appear to be resorting to earnings smoothing, contrary to extant research on this aspect (Taktak, Zouari, and Boudriga 2010).

Model 4 examines the impact of the recent economic crisis on the provisioning behavior of Islamic banks. If Islamic banks were relatively more affected by the crisis and therefore lowered their LLPs, one would expect a negative coefficient. The results appear to suggest no perceptible impact of the crisis on the Islamic banks.

The final specification examines the capital management hypothesis for Islamic banks. As observed from Model (5), the coefficient on the interactive term is positive with a point estimate equal to 0.126. The overall impact is 0.027, implying that Islamic banks are less engaged in capital management as compared to commercial banks.

In sum, the results provide support for the fact that GCC banks engage in both capital management and income smoothing.

6.3 Results for the Signaling Model

Support in favor of the signaling theory would suggest that the coefficient on ΔEBT variable would be positive (Wahlen 1994; Anandarajan, Hasan, and McCarthy 2007). The evidence strongly rejects the signaling hypothesis: in

Table 6: Determinants of loan loss provisions – tests of the signaling model.

Variables	Dependent variable = LLP							
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Constant	0.0002 (0.0002)	0.0006*** (0.0002)	0.0006** (0.0003)	0.0001 (0.0002)	-0.001*** (0.0003)	0.001*** (0.0003)	-0.0009** (0.0004)	-0.001*** (0.0004)
LDV	0.223*** (0.006)	0.428*** (0.006)	0.285*** (0.005)	0.228*** (0.006)	0.585*** (0.006)	0.601*** (0.006)	0.606*** (0.007)	0.587*** (0.007)
Concentration	0.004 (0.003)	-0.004 (0.003)	0.0008 (0.004)	0.003 (0.004)	-0.038*** (0.006)	-0.034*** (0.006)	-0.033*** (0.006)	-0.038*** (0.005)
Fin. Development	-0.007*** (0.001)	-0.005*** (0.001)	-0.007*** (0.001)	-0.006*** (0.001)	0.023*** (0.002)	0.024*** (0.002)	0.024*** (0.002)	0.023*** (0.002)
DEPRT	0.013*** (0.004)	0.008** (0.004)	0.014*** (0.005)	0.010*** (0.004)	0.017*** (0.004)	0.008*** (0.005)	0.014** (0.007)	0.016*** (0.005)
LTA	-0.006*** (0.001)	-0.011*** (0.001)	-0.008*** (0.001)	-0.006*** (0.001)	-0.036*** (0.003)	-0.039*** (0.003)	-0.039*** (0.002)	-0.036*** (0.003)
Equity/Asset	0.001 (0.002)	0.008*** (0.002)	-0.004** (0.002)	-0.0009 (0.002)	-0.034*** (0.005)	-0.031*** (0.004)	-0.046*** (0.005)	-0.034*** (0.005)
EBTA	0.009 (0.021)	0.021*** (0.007)	0.019** (0.009)	0.012* (0.007)	0.074*** (0.009)	0.071*** (0.009)	0.105*** (0.005)	0.074*** (0.010)
ISLAMIC	0.0005*** (0.0001)	0.0009*** (0.0002)	0.0005*** (0.0001)	0.0004** (0.0001)	0.0006** (0.0003)	0.0008*** (0.0003)	0.0005* (0.0003)	0.0007** (0.0003)
CRISIS	0.003*** (0.0005)	0.004*** (0.0004)	0.004*** (0.0006)	0.004*** (0.0005)	0.005*** (0.0006)	0.005*** (0.0006)	0.004*** (0.0007)	0.005*** (0.0006)
GDPGR	-0.003 (0.002)	-0.002 (0.002)	-0.001 (0.002)	-0.004 (0.003)	-0.027*** (0.005)	-0.027*** (0.003)	-0.021*** (0.005)	-0.026*** (0.005)
ΔEBTA	-0.078*** (0.006)	-0.379*** (0.009)	-0.178*** (0.007)	-0.085*** (0.006)	-0.089*** (0.009)	-0.303*** (0.008)	-0.250*** (0.011)	-0.089*** (0.009)
ΔEBTA*ISLAMIC		-0.0009*** (0.0002)				0.239*** (0.008)		

Model 1, the coefficient on $\Delta EBTP$ is negative and strongly significant with a point estimate equal to -0.078 : an increase in LLPs, at time t , is associated with a lower one-year ahead reported earnings (Table 6).

6.4 Signaling Model: Robustness

As earlier, we conduct several additional checks of the baseline results. First, we examine the signaling behavior of Islamic banks. As observed from Model (2), the coefficient on the interactive term $-\Delta EBTA * Islamic$ is negative and significant at the 0.01 level. Taken together with the coefficient on $\Delta EBTA$, this implies that Islamic banks engage less in signaling behavior as compared to non-Islamic banks.

Second, we test whether the signaling behavior of Islamic banks is more manifest in the upswing of the business cycle. Once again, the evidence in Model 3 refutes this hypothesis, although overall, there is evidence in support of signaling.

The final model explores whether Islamic banks had resorted to signaling behavior during the crisis. Here again, there is limited evidence in support of this claim.

Summing up, the results provide limited support to the signaling hypothesis, although there is some evidence of this fact during the upswing of the business cycle.

7 Concluding Remarks

In the aftermath of the financial crisis, policymakers are searching for ways to address the procyclicality of bank credit behavior and mitigate its adverse consequences for the real economy. In this context, the issue of LLPs has attracted significant attention. Using data on GCC banks, the paper examines the relevance of LLPs in bank capital. The findings indicate that LLPs are used by banks both for purposes of capital management and income smoothing. In addition, the findings suggest that Islamic banks engage less in capital management and signaling behavior.

The aforesaid findings highlight several policy concerns. First, since provisioning entails a cost on banks with no immediate benefits, banks tend to defer provisioning for delinquent loans. This suggests a need to design policy so as to incentivize banks to make adequate provisions in good times so that weaknesses

in balance sheet do not impair their smooth functioning, when the situation turns adverse.

Second, decision by banks on LLPs appears to be inextricably linked to their capital position. The findings regarding a negative association between capital and LLPs is consistent with the idea that the capital levels set by banks are designed to cover for unexpected losses.

Recent work by international organizations and standard-setting bodies has provided several policy prescriptions to address the procyclicality of bank lending (IMF, 2009; BIS 2009, 2010). For example, the countercyclical capital buffer proposed as part of Basel III standards is a notable example. The buffer guide would trigger increases in the capital buffer if the credit-to-GDP ratio in a country increases significantly relative to its long-term trend. Supported by a broad range of other financial and macroeconomic indicators, this is expected to dampen procyclicality and lower the magnitude of the amplifications in economic cycles.

In this context, the role of macroprudential policies has assumed relevance. Countercyclical prudential regulation through variation in risk weight and provisioning requirements to moderate credit growth in segments of the financial system that seem in danger of over-extension have been undertaken in several countries such as India (commercial real estate and housing loans), Korea (credit card business), Indonesia (housing loans), Portugal (housing loans) and Romania (consumer and mortgage loans).

There is an increasing recognition of the fact that inadequate provisioning policies could prolong banking fragility, and more so when the economy is in a downturn. As a result, policymakers are trying to ensure that such policies have a built-in forward-looking focus, taking on board the differences in fiscal, institutional, accounting and prudential requirements across countries. Keeping these concerns on board, several countries have devised variants of dynamic provisioning (e.g., Spain, UK and Peru) in order to safeguard their banking systems against adverse shocks.

Appendix: Summary statistics of the variables

Variable	Empirical definition	Data source	N.Obs	Mean (SD)	p. 75	p. 25
Dependent						
LLR	Loan loss reserve/ Total asset	Bankscope	1,075	0.032 (0.043)	0.04	0.008
LLP	Loan loss provisions/ Total asset	Bankscope	1,075	0.005 (0.011)	0.006	0.0001
Independent: Bank-specific						
LTA	Log (Total asset)	Bankscope	1,075	6.475 (0.685)	6.995	6.027
Equity/Asset	Total equity/ Total asset	Bankscope	1,648	0.143 (0.202)	0.164	0.087
EBTA	Operating profits/Total asset	Bankscope	1,075	0.019 (0.057)	0.028	0.013
NPLs	Non-performing loans/Total loans	Bankscope	1,648	0.036 (0.079)	0.041	0.014
Ch_loan	Real change in total loans, defined as $\text{Log}[\text{Loan}(t)] - \text{Log}[\text{Loan}(t-1)]$	Bankscope	943	0.071 (0.136)	0.117	0.017
Independent: Macroeconomic						
GDPGR	Growth rate of real on-oil GDP	IMF	1,624	0.066 (0.047)	0.083	0.038
DEPRT	Real deposit rate	World Bank	1,604	0.011 (0.039)	0.035	-0.012
Independent: Banking industry						
Concentration	Assets of three largest banks/Assets of all commercial banks	World Bank	1,624	0.690 (0.149)	0.820	0.542
Fin. Development	Private credit by banks/GDP	World Bank	1,624	0.515 (0.170)	0.600	0.141
Independent: Dummy variables						
ISLAMIC	Dummy = 1 if a bank is Islamic, else zero	Bankscope	1,648	0.447 (0.497)		
CRISIS	Dummy = 1 for 2009, else zero		1,648	0.061 (0.239)		

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