Use of Loan Loss Provisions for Capital and Earning Management by Chinese Banks

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Abstract

This thesis use data from 2010-2016 to study the use of loan loss provisions of Chinese banks in post crisis period. We carry out research to examine how banks' capital and earning management incentives impact their use of loan loss provisions and explore difference between publicly held and privately held banks. Our result provides evidence that both publicly held and privately held bank engage in earning management to smooth earnings and private bank engage in capital management much more aggressively than public bank. We also examine the impact of debt instrument issuance and seasonal equity offerings on the use of loan loss provisions. We find clear evidence that listed bank decrease discretionary loan loss provisions before seasonal equity offerings to boost accounting profit while impact of debt issuance remains unclear.

1 Introduction

Commercial banks follow relevant accounting standards to disclose information for stakeholders to know their operation conditions. Recent years have witnessed not only repaid growth of Chinese commercial banks in terms of asset size and profits but also remarkable change of relevant accounting standards and regulatory scheme after great financial crisis: new Basel accord was advocated and accepted by a majority of countries including China to ensure soundness and stability of banking system. As Chinese economy entered downward cycle and growth rate dropped sharply, regulators actively conduct prudential regulations to ensure that commercial banking system remains stable and keep enough power to combat the worst situation to come as highly leveraged banking industry will face great pressure when economy goes into bad period. Regulators also stress the importance of counter cyclical management of commercial banks: the critical role of commercial banks as credit suppliers of economy should not be weaken by the increase in generation of impaired loans as pro cyclical contraction of bank's credit supply is considered an important contributor to further recession of already troubled economy in general. In China, regulators can actively engage in window guidance to manage the credit supply behavior of banking

system in macro sense for the best interest of national economy. How the two seemly opposite motives of regulators reconcile and influence bank's behavior is of interest to us.

On the other hand, as commercial banks become one of the major groups that benefits from the fast developed capital market, debt and equity financing has been frequently observed after 2010. To ensure that accounting information disclose objective and high quality information investors in need of, finance department adopt a series of new accounting standards. Loan loss provisions, as most the important accruals of banks, attracted attention from both investors and regulators as they are highly discretionary and manipulation of loan loss provisions may impair the truthfulness and objectivity of disclosed information. In 2006, the no.22 rule of newly implemented accounting standard specify the usage of loan loss provisions, requiring bank to adopt method of future cash flow discounting and objective measurement of loss from asset impairment. The no.37 rule of new accounting rule require that the make and charge off of loan loss allowance must be disclosed. However, Chen et al.(2015) did not find evidence that such accounting rules implemented in 2016 significantly influence the way commercial banks use loan loss provisions to manage earnings. In 2011, China Bank Regulation Commission announced *guidance of implementation of new regulatory standards of banking industry,* requiring that commercial banks adopt dynamic loan loss provisions scheme. In 2012, Finance Department announced *provisions management for financial institutions*. According to this document, financial institutions should counter-cyclically manage their provisions according to macroeconomic environment: make more provisions in booming periods; make less provisions in downward period and utilize loan loss allowance accumulated in good years to absorb the losses from asset impairment in bad years. The implementation of this instruction can be vividly illustrated by the sharp decrease of loan impairment cover ratio: the ratio of loan loss allowance to impaired loans since 2011, a phenomenon that has attracted much attention from finance media. Chen et al. (2015) also argued that as public and private banks differ vastly in terms of corporate governance structure and sources of financing, it is necessary to treat them separately in research on commercial banks; for the same reason, different kind of bank: state owned banks, joint stock banks, city banks and rural commercial banks should also be treated separately in future research. In their research on debt financing of commercial banks, they conclude that banks that have more outstanding debt before maturity tend to make additional loan loss provisions to signify stability because banks are assumed to care about liquidity and price of their debt in market.

Despite the importance of loan loss provisions, the use of them has not been clearly understood: study on how banks use loan loss provisions for earning and capital management is scare among academic literatures and results appear inconclusive as many existing literatures draw opposite conclusions: this phenomenon may be attributed to the fact that data of Chinese banks before 2011 is scare so sample size is small, usually less than 100, making result sensitive to regression design. As more banks begin to disclose their financial information after 2010, dataset on Chinese banks becomes richer and our research are

able to yield more convincing result using more comprehensive dataset. We employ richer dataset available for now to carry out research on a variety of topics related to the use of loan loss provisions: capital and earning management, difference between public and private banks and impact of debt and equity financing.

2 Literature Review

The accounting literatures typically design research method to examine capital and earning management incentives in use of loan loss provisions based on assumption that correlation between provisions and capital ratio can be interpreted as indicator of capital management and that correlation between pre-provision earnings and provisions interpreted as measure of earning management motives. Few literatures has tried to identify capital and earning management motives using groups not influenced by such motives as benchmarks because they usually barely exist. To separate the motives for earning and capital can also be difficult because retained earnings are also included in the numerator of capital ratio. Changes in accounting standards sometimes yield control group that can be used for comparison For example, the effect of loan loss provisions in pre-Basel and post-Basel period differs sharply and this change in motive of commercial banks helps identify capital management and benefits interpretation of the correlation between provision and capital ratio.

The opposite effect of loan loss allowance on regulatory capital in pre and post Basel periods provides possibility to identify capital and earning management incentives separately. Before Basel accord, loan loss allowance was included in regulatory capital so low capital banks had incentives to increase discretionary provisions to meet capital requirement at the expense of profits. In accordance with what mentioned above, this imply a negative correlation between provision and capital ratio. Moyer (1990) did find a negative relation between capital ratio and provisions in this period. He concluded that banks with capital ratio tend to increase discretionary loan loss provisions to increase their capital ratio. After the implementation of Basel Accord, the loan loss allowance were no longer included in regulatory capital. So in contrast to pre-Basel period when loan loss provisions increase capital ratio, in post-Basel period loan loss provisions decrease capital ratio. In accordance with this change, low-capital banks have incentives to decrease their provisions to meet capital adequacy requirement. Ahmed et al. (1999) find that the correlation between capital ratio and provisions became less negative in the post-Basel period. However, although many literatures draw conclusions that banks' incentive to increase discretionary provisions to increase regulatory diminishes, it is not clear if low capital banks have incentives to decrease provisions to increase regulatory capital to avoid violating capital adequacy requirement.

Beatty et al. (2002) find that relative to private bank, public banks report small earning declines and longer strings of consecutive earnings increases because they are more likely to use loan loss provisions and security gain real-

izations to eliminate small earnings decreases and perceive this findings as an evidence that public banks engage more aggressively in earning management. He reasoned that managers of public banks are under more pressure to report consistently increasing earnings because shareholders of public banks are more likely to rely on simple earnings-based heuristics, such as comparisons of current and prior period earnings to evaluate bank performance while shareholders of private banks are likely to rely on more comprehensive information.

For the loan loss discretionary provision model employed by banking literature, Beatty et al. (2014) concluded that in contrast to non-bank literatures when the number of loan loss provisions is limited, there is not a consensus on how to best model loan loss provisions in banking industry.

Despite the fact that banks mainly finance themselves through debt instrument, a majority of literatures that explore financing of banks choose to focus on equity financing and many of them examine equity valuations response to loan loss provisions. Nichols et al. (2009) find that public banks tend to provide timelier recognition of loan loss provisions and argue that this fact may either be due to incentives of mangers to mitigate information asymmetry or to engage in capital, earnings or tax management. Eillot et al (1991) examines pre-Basel periods before 1991 and argued that market interpret additional loan loss provisions favorably because it signals manager's willingness to deal with troubled loans actively. While in a strand of other literatures, discretionary loan loss provisions is considered to be favorably interpreted because they signal that banks can withstand a hit on profits provisions bring, which means that banks are considered "good type". Such signal effect can be more accurately identified in the post-Basel period because loan loss provisions no longer increase regulatory capital in this period. To explore commercial banks' debt financing, Black et al. (2004) find that when regulatory monitoring increases, the number of debt covenants tend to decrease and view this as an evidence that regulatory monitoring can act as a substitutes for debt covenants monitoring. Livine et al. (2011) find that CEO cash bonus and fair value valuation of corporations are positively correlated, implying that there is a potential possibility that self-interested executives may engage in manipulation of fair value to increase their own bonus. Blackwell et al. (1994) find that the performance of subsidiaries of banks are negatively correlated with turnover rate of subsidiary managers, a fact that suggest that performance is not only used to determine performance pay but also determine the length of tenure for bank manager; this may give managers of bank additional incentives to engage in profit manipulation.

The pro-cyclicality of banks' loan loss provisions during business cycle has attracted attention because it can potentially make credit supply and thus economic more pro-cyclical. It is observed that banks cut lending sharply during the financial crisis as impaired loan and loan loss provisions increases, this backward looking loan loss provisions practice is considered to have aggravated economic recession. Bikker and Metzemakers (2005) find that bank loan loss provisions are substantially higher when GDP growth is lower, implying that banks' loan loss provisions practice are very pro-cyclical. Beatty and Liao (2011) find that banks that are less timely in recognizing loan loss provisions

are more likely to cut lending in recessionary period, this research output indicates that forward looking provision model may help mitigate pro-cyclicality of bank lending.

3 Hypothesis Development

We combine theoretical foundation covered in previous literatures and the fact about Chinese commercial banks to develop several hypothesis that we can directly use currently available data to examine.

Public vs Private Banks: capital management and earning management

We give a systemic examination of capital and earning management behavior of commercial banks and pay special attention to the difference between listed and unlisted banks.

As is covered in the literature review, earning management motives of commercial banks to smooth earnings across different periods can be detected by positive correlation between earnings before LLPs and LLPs. How the coefficient of capital adequacy ratio should be seems less certain. Since the Basel Accord was implemented, to increase loan loss provisions actually decrease regulatory capital since loan loss allowance is not longer included in regulatory capital. However, literatures that directly examine the correlation between regulatory capital and LLPs in the new regime is rare possibly because it is hard to identify earning and capital management motives separately now that they function in the same direction. But literatures did find that correlation between regulatory capital and LLPs became less negative in the new regime compared to pre-Basel period. We nevertheless hypotheses that correlation between regulatory capital and LLPs are positive for our sample because low capital banks have incentives to decrease discretionary LLPs to increase earnings to capitalize themselves.

H1 The correlation between LLPs and earnings before LLPs and taxes are significantly positive.

H2 The correlation between LLPs and capital ratio are significantly positive.

Capital ratio in the same period is endogenous as it includes retained earnings that is affected by LLPs so literatures often choose to explore correlation between capital ratio before LLPs and LLPs. Capital ratio before LLPs is difficult for us to compute because some part of data needed to compute denominator of capital ratio is not included in our database so we choose to use lagged capital ratio instead.

The difference between executives' incentives of pubic and private banks is more unclear in case of commercial banks in China. In articulating reasons that public bank executives have more incentives to engage in earning management, Beatty (2002) reasoned that ownership of pubic bank in US is diffuse so that shareholders lack motives to monitor banks' behavior carefully but choose to

rely on simple heuristics such as earning increase so that managers have strong incentives to engage in earning management to ensure that earnings increase smoothly because reduction in earnings can lead to remarkable discount to performance of banks because it means that bank's performance lacks stability that investors value. In contrast to public firms, ownership of private firms is concentrated. Private firms have a much smaller number of shareholders and a large proportion of the directly participate in management of the firms. As information asymmetry in listed banks is much larger as a larger proportion of its shareholders are outsiders, managers have greater incentives to signal stability of banks by smoothing earning. However, we are not sure if this argument applies to commercial banks in China generally because many of them have a controlling shareholder (usually a government agent or a state owned entity) that can largely alleviate free riding problem in monitoring. The state entity shareholders usually have a no less than 5 representatives at the corporate board and even directly send chair of board to banks. This is in sharp contrast to the case of US where largest shareholders of banks are usually indexes fund or asset management firms that do not actively engage in operations of firms. However, one may still argue that the reliance on simple heuristics apply to investors that do not have much stake at banks and some public banks in China that is not state owned actually do not have a controlling shareholder . Another reason used to support the claim that managers of public banks are more likely to engage in earning management is that pay for performance sensitivity for executives for listed banks is larger because they establish better mechanism to reward good performance such as stock options and management stock holdings. However, this also may not be the case because pay for performance sensitivity in Chinese banks is rather low: the scope of pay for performance is very limited in most listed banks; in four state owned banks, there is even no pay for performance mechanisms: income of executives are not only not related to performance of banks but also extremely low in absolute value. What's more, few executives in commercial banks hold stocks of own corporation they manage. Due to such facts, it is usually agreed that executives of commercial banks in China lack incentives to ensure that stock price reflect the true value of banks. We nevertheless state our hypothesis in positive form here: that the measure of earning management, correlation between LLPs and earnings before LLPs, are more positive for public banks than for private banks.

As for capital motives, we hypotheses that managers of public banks have more incentives engage in capital management for similar reasons as stated above for earning management: they want to signify stability and good conditions of banks through constant satisfying capital ratio to investors that are subject to much larger information than that of private banks. However, as public banks are mostly consist of large banks, it may be the case that their additional incentives for capital management, if really exists, originates from stronger regulation that large banks are subject to. So we will have to pay attention to differentiate effect of pubic status of banks and large size of banks. On the other hand, public banks can raise equity to efficiently capitalize themselves through equity market and past five years have witnesses tremendous amount of

seasonal share offerings issued by banks in stock market. Their ability to raise capital directly may lessen their incentives to decrease discretionary earnings for capital management. We nevertheless state our hypothesis in a positive way here: that correlation between lagged capital ratio and LLPs are more positive for pubic banks than for private banks.

H3 The correlation between LLPs and earnings before LLPs and taxes are more positive for public banks than for private banks.

H4 The correlation between LLPs and lagged capital ratio are more positive for public banks than for private banks.

We use one regression form to test the four hypothesis above.

Impact of Seasonal Equity Offerings

As mentioned above, one of the distinguishing feature of public banks relative to private banks is that public banks can issue shares to raise fund and they often do so during the period 2010-2015 our data sample covers when impaired loans piled up and cause capital losses. We are interested in how banks' earning management motives change in response to seasonal stock offerings. The higher the price banks make seasonal stock offerings, the less stocks they will have to offer to raise certain amount of equity and the less will original shareholder's equity be diluted, which means that the expense of equity offerings is lower for banks if equity can be offered at higher price. This implies that banks have additional incentives to engage in earning management to make sure that loan loss provisions and earnings appear in a favorable way. This influence can be either way, Beaver et al. (1998) find that the correlation between market value and additional loan loss allowance is positive because market interprets loan loss allowance as a positive signal that banks are willing to deal with impaired loans actively. in this sense, managers of public banks have motives to increase discretionary loan loss provisions for favorable opinion of market. However, as Beatty et al. (2002) argues, investors of public corporations are more likely to rely on single heuristics such as earnings relative to prior period to evaluate their performance. It is equally possible that banks decrease their loan loss provisions in order to boost their profit before seasonal stock offerings. We state our hypothesis in a positive here, but this does not mean that we are more inclined to expect so.

H5 The correlation between LLPs and earnings before LLPs and taxes are more positive for public banks before seasonal stock offerings.

As the purpose of seasonal stock offerings themselves are to raise capital for banks in need, it seems that there is no clear reasons to investigate capital management in this regime.

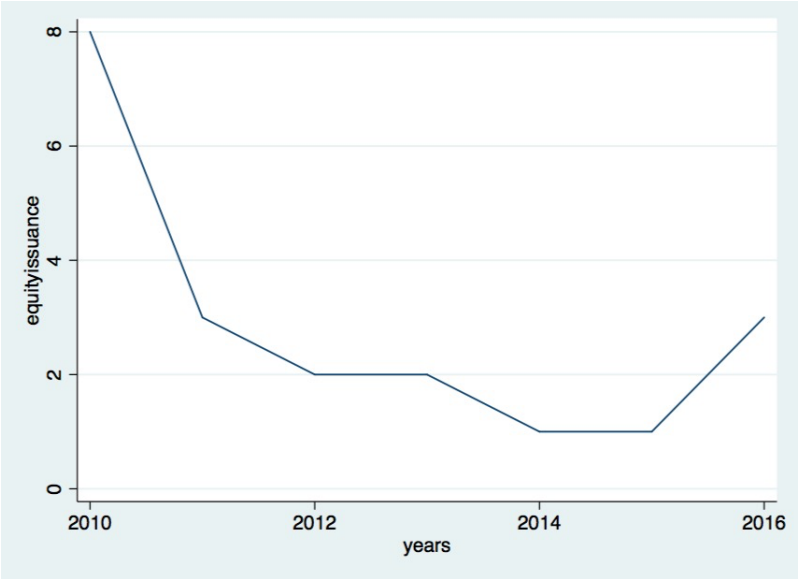

Figure 1: Number of listed banks that issue additional stocks

Impact of Issuance of Commercial Bank Bonds

For similar reasons, we examine banks motives to use loan loss provisions for earnings and capital management before issuance of commercial bank debt. The banks have reasons to increase or decrease discretionary provisions for reasons we analyze in case of equity offerings for the favor of market so that commercial bank debt can be issued at a favorable interest and banks can raise fund at lower cost. Examining debt issuance has advantages over examining additional stock offerings. All banks can issue debt so we can use larger samples and the conclusion drawn have wider applications. There is also disadvantages though: bond investors may be much less sensitive to financial condition and thus the use of loan loss provisions than stock investors. The earning record is largely irrelevant for bond investors as their return will only be influenced by solvency. There is long run tradition of implicit guaranteed full payment of bond in Chinese bond market and commercial bank debts, among all kinds of non government debts, are considered to be safest. The tradition of guaranteed payment is most vividly illustrated by markets' preference for high yield bond during certain time periods. Banks that are backed by government agent as controlling shareholders are considered extremely safe. Most of banks in China, less or more, are backed by government agent as their shareholders. Black et al. (2004) find that regulatory monitoring can act as substitutes for debt covenants. Banking are among most heavily regulated industry so the need for bond holders to concern with its solvency seems in doubt, especially in China where practice of guaranteed payment prevails. We state our hypothesis in positive form here

just for convenience.

H6 The correlation between LLPs and earnings before LLPs and taxes are more positive before issuance of commercial bank debts.

The public banks and private banks, especially those private city and rural commercial banks, differ vastly, so we will choose private city and rural commercial banks as a group to examine separately to check the robustness of our conclusion.

4 Data

We use Orbis database to collect panel data on commercial banks.

Orbis database provides five years record for public banks and three years record for private banks, data of a year of a bank is only included in our sample if all necessary data needed in our research is available. We also look for data of years not included in Orbis database but are disclosed in yearly financial summary of the banks in their annual report for some years missing in Orbis database. However, note that we only look at the financial summary presented at the first section of banks' annual report but do not try to find data in banks' detailed financial report because it is too demanding to do so. We also only try to search for periods not included in Orbis database: if data of a year is included in Orbis but some key variables is lacked, we will not search for it in corresponding financial summary but will drop this year from our sample. Overall, There are 348 samples included in our database, they cover 105 banks that have at least one year drawn in samples and time period covered range from 2010 to 2015. As can be easily seen, this means that most of banks are do not have a full record from 2010 to 2016. This is either because some of the key variables needed in our research is not available in database or because banks themselves do not disclose detailed financial information in that year.

The key variables of yearly data obtained from financial report are banks' total asset, loan loss provisions, tier 1 ratio, impaired loans, gross loans, profit before tax, net fees and commissions and loan loss reserves, all of which will enter our designed regression equation in some form. The type of banks is an important control variable as mentioned above and there are four categories of banks among commercial banks in China: state owned banks, joint stock banks, city commercial banks and rural commercial banks. Categories of banks are important because they imply different governance structure and shareholder structure and very likely, management style. We include three dummy variables to indicate categories to which the banks belong and set state owned banks as a benchmark category. Information categories of banks are obtained from official website of Commission of Bank Regulation of China which has a full list of banks and their basic information. For city and rural commercial banks, annual increase in GDP corresponds to the province in which they locate. For state owned and joint stock banks, annual increase in GDP corresponds to the GDP change of nation as a whole. Data on GDP annual growth are obtained

from *Yearly Book of China Statistics.* We obtain information on public status of banks: whether the banks have been listed and when they go listed from http://eastmoney.com; we also obtain information from this website on banks' season equity offerings. We obtain information on issuance of commercial bank debt and second market instrument debt from official website of China Central Clearance Company Limited. The table below summarizes main characteristics of data collected.

5 Regression Design

Test of Hypothesis 1-4

We design regression form to examine the hypothesis we made above. As Beatty et al. (2014) summarized: there has not been a consensus on how to model discretionary provision in banking industry and different model relies on different assumption in terms of which variable is exogenous. So we will pay special attention to designing our regression forms and make sure that conclusions we made can sustain several regression specifications.

We use the following regressions to test hypothesis 1 to 4.

$$\begin{aligned} LLPR = {} & \beta_0 + \beta_1 Jointstock + \beta_2 Rural + \beta_3 City + \beta_4 LLA + \beta_4 TA + \beta_5 \triangle GDP \\ & + \beta_6 CFEER + \beta_7 EBT + \beta_8 MCAP + \beta_9 Listed + \beta_{10} Listed * MCAP \\ & + \beta_{11} Listed * EBT + \beta_{12} I.Bank + \beta_{13} I.Years \end{aligned}$$

Where:

LLPR	ratio of LLPs to gross loans outstanding;
LLA	ratio of actual loan losses to total assets;
TA	natural logarithm of total assets;
$\triangle GDP$	change in gross domestic product, a proxy for the change in economic growth;
MCAP	lagged ratio of actual regulatory capital (Tier 1 capital) to the lagged minimum required regulatory capital;
EBT	ratio of earnings before taxes and LLPs to total assets;
CFEER	ratio of net commission and fee income to total asset;
Listed	dummy variable (1 if listed commercial bank, and 0 if unlisted commercial bank);
Listed*EBT	interaction of public status dummy with EBT
Listed*MCAP	interaction of public status with MCAP

Table 1: Pearson Correlation Matrix

	LLPR	*Listed*	*State*	*Jointstock*	*City*	*Rural*
LLPR	1.0000					
Listed	-0.1096	1.0000				
State	-0.1433	0.5049	1.0000			
Jointstock	0.0122	0.3933	-0.1430	1.0000		
City	0.0892	-0.4314	-0.3427	-0.5195	1.0000	
Rural	-0.0228	-0.2020	-0.1444	-0.2189	-0.5246	1.0000
$\triangle GDP$	-0.1403	-0.2416	-0.1695	-0.2654	0.2542	0.0591
TA	-0.1228	0.7910	0.6426	0.4552	-0.5013	-0.2737
EBT	0.2699	-0.0684	0.0061	-0.1500	-0.0563	0.2173
MCAP	-0.1250	-0.0617	-0.0262	-0.0684	0.0734	-0.0077

	$\triangle GDP$	*TA*	*EBT*	*MCAP*
$\triangle GDP$	1.0000			
TA	-0.4226	1.0000		
EBT	-0.0187	-0.2322	1.0000	
MCAP	-0.0202	-0.1250	-2082	1.0000

Jointstock dummy variables (1 if categorized as a joint stock bank by CBRC, and 0 if otherwise)

Rural dummy variable (1 if categorized as a rural bank by CBRC, and 0 if otherwise)

City dummy variable (1 if categorized as a city bank by CBRC, and 0 if otherwise)

I.Bank dummy variable for each individual bank

I.Years dummy variable for each year

The pearson correlation matrix of variables are presented below.

In this regression we combine fixed sample effect to allow intercept to differ among each individual banks to capture unobserved difference among different banks. We also combine fixed year effect to allow intercept to differer among each year. This is essential for us to capture effect of countercyclical regulatory cycle: that regulator use window guidance to lead commercial banks to release profits from loan loss allowance in downward economic cycles. This effect can be clearly seem from the change of impaired loans covered ratio that dropped sharply from 2011 to 2015: banks discretionarily make less loan loss provisions as shown in Figure 1 as magnified by continued decrease in loan loss cover ratio.

We allow intercept to differ for different categories of banks: state owned bank, joint stock banks, city commercial banks and rural commercial banks as they are quite different in terms of shareholder structure, corporate governance structure, asset (primarily loans) composition and the extent to which they are regulated: large banks that are important to national economic system tend

Figure 2: Loan loss cover ratio of a set of representative banks that have full record of data from 2010 to 2015

to draw more attention from regulators. We allow intercept to differ between listed and unlisted banks. For the reasons we discussed when developing our hypothesis, listed banks are expected to make more loan loss provisions both to signify stability and to satisfy the requirement of regulators as systemic important financial institutions are more constrained by regulations. However, in case of China, it is easy to say from data that unlisted banks on average make more loan loss provisions normalized by total asset because they are more vulnerable to idiosyncratic shocks that are local or specific to certain borrowers and their asset are usually of inferior quality compared to listed banks. Since we do not have data on asset composition of banks, we can only rely on bank dummy variable to capture such effects. So overall, we do not expect coefficient of *Listed* to be of a particular sign.

As Ahmed et al. (1999) did, we use EBT, the ratio of earnings before taxes and LLPs to total assets to examine the use of LLPs for earnings management. Variable EBT in our model measures the extent to which unlisted banks use loan loss provisions for earnings management. Our model also includes the interaction variable Listed* EBT to examine whether listed commercial banks engage in earnings management more aggressively than unlisted banks. For various reasons we discuss in detail in first section, we anticipate listed banks to have greater incentive to use LLPs to manage earnings than unlisted banks and the coefficient on Listed*EBT is positive. We use lagged tier 1 capital ratio MCAP to examine the use of LLPs for capital management and this method is not the same as many other literatures that use regulatory capital ratio before LLPs to

examine capital management motives. This is only because the Orbis database only provide very preliminary data on bank and we find it hard to compute capital ratio before LLPs so we shift variable to lagged capital ratio to avoid endogeneity. Although Ahmed et al. (1999) use the ratio of actual regulatory capital before loan loss reserves to the minimum required regulatory capital to indicate the use of LLPs for capital management and expect the coefficient to be negative as low capital ratio banks have incentive to increase discretionary LLPs to increase regulatory capital ratio before their research focus on pre-Basel period in which loan loss allowance is included in regulatory capital. The coefficient of MCAP in our research regime is expected to be positive because in the post-Basel period loan loss allowance is no longer a part regulatory capital so low regulatory capital banks have incentive to decrease discretionary loan loss provisions to increase capital ratio. The interaction variable Listed* MCAP is another key variable included in our model to examine whether the level of capital adequacy ratio influences how listed commercial banks use LLPs relative to unlisted commercial banks. If listed banks engage in capital management using loan loss provisions more aggressively, we expect the coefficient of Listed*MCAP to be positive.

Our model includes several control variables. The change in GDP, $\triangle GDP$, is a proxy for the change in economic growth. When GDP growth becomes slow and economic goes downward, firms are more likely to have trouble repaying their debt and banks would be induced to increase LLPs to take account of additional risk and the coefficient of $\triangle GDP$ is expected to be positive. We include the variable TA as a proxy for bank size and expect the coefficient on this variable to be negative, smaller banks are more vulnerable to problems of impaired loans and it is known that large banks have better asset quality than small and local banks because they have better governance structure and loan sources. We include LLA to take account of the level of risks faced by banks and expect its coefficient to be positive. If loan losses are higher, the bank has to increase LLPs to take into account of the additional risk. According to Hasan and Hunter (1999), higher commission income may indicate banks' engagement in non-depository banking activities. Banks may allocate additional loan loss reserves to provide an image of safer institutions because non-loan banking activities are usually considered more risky than loan making. This control variable is particularly important when Chinese banks initiated the so called financial innovation that help them to circumvent financial regulation and increase their asset through the form of non-depository activities. Therefore, we expect the coefficient on CFEER to have a positive sign.

Test of Hypothesis 5

We use data of all public banks in our sample and introduce a dummy variable D_E to indicate the year before public banks' seasonal equity offerings. The financial report of commercial banks in previous year is likely to be the most important information source rendered by equity investors that is highly credible (audited) and disclosed at this year, usually at April. So commercial banks that

plan to announce additional stock offerings are most likely to engage in earnings management for this purpose in previous years.

We use dummy D_E to examine how banks' make of loan loss provisions a year before seasonal equity offerings differs from other years. It is either possible that banks tend to make less or more loan loss provisions for equity offerings: as discussed in the third section, banks may want to increase discretionary loan loss provisions to signify their ability to sustain a temporary reduction in earnings and their willingness to proactively deal with bad loans that is perceived as a positive signal by investors. However, banks may also have incentives to decrease discretionary loan loss provisions to boost their earnings in accordance with the argument that investors in shares of public banks are likely to rely on simple heuristics, especially earning heuristics to make their investment decisions. This is especially true if banks that do not engage in earning management to increase profits may suffer from a reduction of increase or even negative increase in net income, which is likely to be case of Chinese commercial banks in recent years. On the other hand, only institutional investors participate in seasonal equity offerings, it's hard to tell if they also tend to rely on simple earnings heuristic to make decisions. As also discussed in section 2, we do not try to examine or predict the capital management motives of banks before seasonal equity offerings as the purpose of such offerings is to raise capital.

The following regression specification is used to examine the impact of seasonal equity offerings.

$$\begin{aligned} LLPR = {} & \beta_0 + \beta_1 Jointstock + \beta_2 City + \beta_3 Rural + \beta_4 TA + \beta_5 CFEER \\ & + \beta_6 LLA + \beta_7 \triangle GDP + \beta_8 EBT + \beta_9 MCAP + \beta_{10} D_E \\ & + \beta_{11} D_E * EBT + \beta_{12} I.Bank + \beta_{13} I.Years \end{aligned}$$

Where D_E is a time dummy that indicate the year before bank's seasonal equity offerings: D_E and $D_E * EBT$ are two key variables in our regression. D_E enables intercept to differ for commercial banks in years before seasonal equity offerings and in other years. If holding other control variables constant, commercial banks tend to make more loan loss provisions on average, then the coefficient of D_E is positive; otherwise, its coefficient should be negative. The cross term $D_E * EBT$ allows correlation between EBT and LLPs to differ among years before offerings and non-offering years. If the coefficient is positive, it implies that banks increase discretionary loan loss provisions before seasonal equity offerings. Otherwise, if the coefficient is negative, banks decrease discretionary loan loss provisions before offerings. As in previous regressions, we include a list of variables *Jointstock*, *City, Rural, TA* ,$\triangle GDP$ and *CFEER* to control for basic characteristics of banks. Dummy variables of both banks and years are included to take account of sample and year fixed effect. Variables *EBT* and *MCAP* are included to account for capital and earnings management motives.

Test of Hypothesis 6

We introduce dummy variable D_B to indicate the year before issuance of bond and use the regression form below to examine the impact of bond issuance on loan loss provisions for capital and earnings management.

$$\begin{aligned} LLPR = & \beta_0 + \beta_1 Jointstock + \beta_2 City + \beta_3 Rural + \beta_4 TA + \beta_5 CFEER \\ & + \beta_6 \triangle GDP + \beta_7 LLA + \beta_8 EBT + \beta_9 MCAP + \beta_{10} Listed \\ & + \beta_{11} D_B + \beta_{12} D_B * EBT + \beta_{13} D_B * MCAP + \beta_{14} I.Bank \\ & + \beta_{14} I.Years \end{aligned}$$

The coefficient of time dummy variable D_B measures the difference in make of loan loss provisions between the year before bond issuance and other period on average controlling for other variables. Coefficient of variable $D_B * EBT$ measures how banks' earning management differs before bond issuance and coefficient of $D_B * MCAP$ measures how banks' capital management incentives differs before bond issuance.

6 Regression Result

Result for Hypothesis 1-4

Our first regression result is displayed below.

	(1)	(2)	(3)	(4)
	LLPR	*LLPR*	*LLPR*	*LLPR*
Jointstock	0.0143		0.0121	0.0134***
	(1.66)		(1.46)	(3.83)
Rural	0.00352		0.000391	0.00190
	(0.24)		(0.03)	(0.43)
City	0.00236		-0.000315	0.000748
	(0.16)		(-0.02)	(0.16)
LLA	0.0936***	0.0936***	0.0955***	0.0936***
	(3.38)	(3.38)	(3.45)	(3.38)
TA	0.000574	0.000574	-0.000701	
	(0.11)	(0.11)	(-0.15)	
$\triangle GDP$	0.000331	0.000331		0.000320
	(0.94)	(0.94)		(0.95)
CFEER	0.500	0.500	0.566	0.505
	(1.64)	(1.64)	(1.90)	(1.67)
EBT	0.799***	0.799***	0.781***	0.797***
	(7.49)	(7.49)	(7.44)	(7.59)
MCAP	0.0000412**	0.0000412**	0.0000381**	0.0000407**
	(2.87)	(2.87)	(2.73)	(2.96)
Listed	0.00972	0.00972	0.00890	0.00987
	(1.25)	(1.25)	(1.15)	(1.29)
*Listed*MCAP*	-0.000821*	-0.000821*	-0.000804	-0.000832*
	(-2.00)	(-2.00)	(-1.96)	(-2.09)
*Listed*EBT*	-0.0500	-0.0500	-0.0277	-0.0516
	(-0.16)	(-0.16)	(-0.09)	(-0.16)
2011.years	-0.000547	-0.000547	-0.000902	-0.000509
	(-0.52)	(-0.52)	(-0.91)	(-0.51)
2012.years	0.000295	0.000295	-0.000458	0.000372
	(0.19)	(0.19)	(-0.35)	(0.27)
2013.years	0.00108	0.00108	0.000292	0.00120
	(0.60)	(0.60)	(0.19)	(0.82)
2014.years	0.00295	0.00295	0.00192	0.00309
	(1.37)	(1.37)	(1.03)	(1.77)
[2015.years	0.00842***	0.00842***	0.00735**	0.00860***
	(3.35)	(3.35)	(3.28)	(4.49)
_cons	-0.0252	-0.0252	-0.0124	-0.0211***
	(-0.69)	(-0.69)	(-0.36)	(-3.99)
N	348	348	348	348

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Coefficients of key variables largely align with our anticipation: coefficient of both EBT and MCAP are positive and significant at 1% level, implying that banks that have higher normalized earnings and regulatory capital ratios are more likely to increase discretionary loan loss provisions. The coefficient of EBT

is not only significantly positive but also large in absolute numbers, implying that the correlation between LLPs and earnings before LLPs is large: not only is there strong evidence that Chinese commercial banks use LLPs for earning management but also the measure of the extent of earning management shows that one unit in EBT brings almost 0.8 unit increase in LLPR, although this result should not be misinterpreted as one unit increase in net profit increase 0.8 unit of LLPs because EBT are normalized by bank asset while LLPR are normalized by gross loans outstanding. The positive coefficient of independent variable MCAP are aligned with our expectations that banks with low regulatory capital ratio are more likely to decrease discretionary loan loss provisions to increase earnings that eventually increases regulatory capital.

The coefficient of Listed is insignificant, implying that controlling for other characteristic variables, there is no significant difference between loan loss provisions between public and private banks. As we explained above, we do not predict the variable or the significance of coefficient of variable Listed because the average difference in loan loss provisions is not of much of our concern. But we think that the coefficient of Listed may be insignificant for the same reason as they are insignificant for variable Jointstock, Rural and City ,TA and $\triangle GDP$: sample fixed effect are included so the difference resulted from such variables are already captured by bank fixed effect. The coefficient of LLA is significantly positive, implying that banks perceived more risky in the past as signified by banks larger amount of total impaired loans are likely to make more loan loss provisions. This is likely because that such banks have inferior loan quality.

Coefficient of key variable Listed* EBT is negative and insignificant, implying that public banks do not differ significantly from private banks in terms of earning management. The reason behind may be, as stated above, that executives of public banks in China do not receive much performance compensation, or at least do not receive performance compensation that is related to stock price so they generally lack motives to care about secondary market stock prices. Another possible explanation is that stock investors' inclination to rely on simple heuristic for decision making is alleviated by the presence of a state controlling shareholders or at least large shareholders that focus on the long run performance and stability of banks. Such state shareholders also plays important roles in personnel change of executives in commercial banks. So instead of paying attention to secondary market stock prices, executives care more about evaluations of controlling state shareholders.

Coefficient of key variable Listed* MCAP is significantly positive, implying that public banks do not engage in capital management as aggressively as private banks. In another word, among low regulatory capital banks, public banks are less likely to decrease discretionary loan loss provisions in order to increase tier 1 capital ratio. In fact, the coefficient of MCAP for public banks are almost close to 0: from our result, there is no evidence that public banks use loan loss provisions for capital management. One obvious explanation for this result is that public banks can raise capital efficiently from equity market so they lack incentives to "raise capital from loan loss allowance" as private banks do. Since 2011, the amount of impaired loans of commercial banks of China increase

sharply, resulting in loss of bank equity. Whether commercial banks are able to keep a reasonable capital ratio and continue to maintain healthy operations are cast into doubt. What's more, once equity losses are incurred, banks' ability to extend lending to the economy will be impaired, which will further speed down the downward cycle of economy. In response to such threatens, commercial banks decrease their loan loss cover ratio: the ratio of loan loss allowance to impaired loans and this action can be vividly seen from the graph below. The decrease of loan loss allowance is not only due to increase in impaired loans but also because banks do not make as much loan loss provisions as in good years, which is an illustration of counter cyclical loan loss provisions. Private banks are expected to rely more on this path to raise equity as public banks raise huge amount of capital from stock market. The graph below shows the number of banks that offer seasonal shares in each year since 2011. There is also another possible explanation for negative coefficient of Listed*MCAP: the coefficient of MCAP shows how the make of loan loss provisions differ among high capital ratio private banks and low capital ratio private banks controlling for other relevant variables. The coefficient of Listed*MCAP shows how such difference differs between private and public banks. If there is an exogenous factor that impact the make of loan loss provisions equally among low capital and high capital banks, loan loss provisions will appear less sensitive to capital ratio. If such factor has larger impact on public banks and is not captured by regression, it will make the provisions of loan loss provisions of public banks less sensitive to capital ratio. The counter cyclical management of regulators for commercial banks are a candidate of our considerations:CRBC want to ensure that commercial banks are well capitalized so they can maintain reasonable ability to extend credit to the economy so they continue to use window guidance to lead banks to decrease their loan loss cover ratio to release profit to capitalize themselves and such guidance is not idiosyncratic to the capital ratio of banks. If CRBC pays more attention on public banks, as they are large and more important to the national economic system, this may make the loan loss provisions of public banks less sensitive to their capital ratio compared to private banks. The two possible explanations will be discussed further in next section.

Result for Hypothesis 5

Samples used to examine hypothesis 5 are all available years of public banks and a dummy variableD_E is introduced to indicate the year before seasonal stock offerings.

	(1)	(2)	(3)	(4)
	LLPR	*LLPR*	*LLPR*	*LLPR*
LLA	0.122	0.122	0.0989	0.239
	(0.47)	(0.47)	(0.40)	(0.98)
Jointstock	0.0587***		0.0577***	0.0531***
	(7.88)		(8.97)	(8.97)
City	0.0846***		0.0831***	0.0774***
	(7.84)		(8.97)	(8.48)
Rural	0.0775***		0.0763***	0.0711***
	(7.79)		(8.51)	(8.32)
TA	0.0469***	0.0469***	0.0460***	0.0422***
	(6.91)	(6.91)	(7.86)	(7.48)
CFEER	-0.0870	-0.0870		-0.00672
	(-0.29)	(-0.29)		(-0.02)
EBT	1.242***	1.242***	1.212***	1.218***
	(5.76)	(5.76)	(6.47)	(5.65)
D_E	0.0151**	0.0151**	0.0152**	0.0152**
	(3.17)	(3.17)	(3.21)	(3.16)
$D_E * EBT$	-0.803**	-0.803**	-0.807**	-0.806**
	(-3.09)	(-3.09)	(-3.13)	(-3.09)
MCAP	0.000310	0.000310	0.000294	
	(1.24)	(1.24)	(1.21)	
2011.years	-0.00526***	-0.00526***	-0.00521***	-0.00461***
	(-5.60)	(-5.60)	(-5.69)	(-5.92)
2012.years	-0.00931***	-0.00931***	-0.00916***	-0.00827***
	(-6.86)	(-6.86)	(-7.31)	(-7.72)
2013.years	-0.0121***	-0.0121***	-0.0119***	-0.0108***
	(-7.50)	(-7.50)	(-7.86)	(-8.58)
2014.years	-0.0128***	-0.0128***	-0.0126***	-0.0116***
	(-6.83)	(-6.83)	(-7.35)	(-7.24)
2015.years	-0.00989***	-0.00989***	-0.00967***	-0.00847***
	(-4.34)	(-4.34)	(-4.53)	(-4.28)
_cons	-0.357***	-0.357***	-0.350***	-0.321***
	(-7.24)	(-7.24)	(-8.33)	(-8.01)
N	88	88	88	88

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

In contrast to the regression using samples of both private and public banks, in regressions using only samples of public banks, coefficients of dummies for Jointstock, City and Rural are all significantly positive, implying that controlling for other relevant variables, Jointstock, City and Rural banks tend to make more loan loss provisions on average compared to state owned banks which are benchmarks. The coefficient of TA is also positively significant, indicating that the larger the banks are, the more loan loss provisions they make on average–this may be due to fact that large banks are more leveraged so they are more

vulnerable to risks. The coefficient of EBT is significantly positive as in previous results: public banks actively engage in earning management. The coefficient of MCAP is insignificant, a result that is also aligned with our analysis above: public banks can issue shares to for capital raising so they do not have to engage in capital management to increase regulatory capital ratio.

As discussed above for the earning management of public banks, they generally do not care much for their secondary stock prices. However, the secondary stock prices is critical in determining the price of additional stocks offered and the price of seasonal offerings determines the costs of banks' equity financing. So whether the banks care about prices at which shares are offered is of interest. The coefficient of key variable $D_E * EBT$ is significantly positive, implying that banks that intend to issue additional shares next years tend to make less discretionary loan loss provisions to boost its profit. This can be interpreted as an evidence that banks use loan loss provisions to manage earnings in order to issue additional shares at a favorable price.

Result for Hypothesis 6

With D_B introduced to represent the year before bond issuance, we have the following result.

Coefficient of D_B is significantly positive, implying that commercial banks, overall, tend to make more loan loss provisions before bond issuance in order to signify their stability and willingness to deal with impaired loans problems. The coefficient of $D_B * EBT$ is insignificant: the earning management behavior of banks do not change significantly before bond issuance– this is in accordance with the conjecture that bond investors care about solvency of banks rather than their earnings. The coefficient of $D_B * MCAP$ is significantly negative, implying that only banks with low regulatory capital level have incentives to increase discretionary loan loss provisions to signify their stability before bond issuance.

	(1)	(2)	(3)	(4)
	LLPR	*LLPR*	*LLPR*	*LLPR*
LLA	0.0851**	0.0851**	0.0879**	0.125***
	(3.09)	(3.09)	(3.19)	(4.17)
Jointstock	0.0147		0.0113	0.0417***
	(1.72)		(1.37)	(5.86)
Rural	0.00381		-0.00157	0.0592***
	(0.26)		(-0.11)	(5.36)
City	0.0132		0.00848	0.0663***
	(0.94)		(0.62)	(6.21)
$\triangle GDP$	0.000503	0.000503		0.000572
	(1.50)	(1.50)		(1.80)
Listed	-0.000709	-0.000709	-0.00106	0.000539
	(-0.31)	(-0.31)	(-0.46)	(0.21)
TA	0.00214	0.00214	0.000287	0.0201***
	(0.44)	(0.44)	(0.06)	(5.54)
EBT	0.857***	0.857***	0.843***	0.659***
	(7.98)	(7.98)	(7.86)	(6.02)
D_B	0.00565	0.00565	0.00545	0.00688*
	(1.83)	(1.83)	(1.77)	(2.04)
$D_B * EBT$	0.0637	0.0637	0.0603	0.0442
	(0.56)	(0.56)	(0.53)	(0.35)
MCAP	0.0000474***	0.0000474***	0.0000440**	0.0000367*
	(3.40)	(3.40)	(3.19)	(2.42)
$D_B * MCAP$	-0.000643**	-0.000643**	-0.000620**	-0.000722**
	(-2.93)	(-2.93)	(-2.82)	(-3.02)
2011.years	-0.000638	-0.000638	-0.00114	
	(-0.62)	(-0.62)	(-1.17)	
2012.years	0.000486	0.000486	-0.000628	
	(0.33)	(0.33)	(-0.50)	
2013.years	0.00146	0.00146	0.000348	
	(0.86)	(0.86)	(0.23)	
2014.years	0.00340	0.00340	0.00196	
	(1.68)	(1.68)	(1.10)	
2015.years	0.00899***	0.00899***	0.00754***	
	(3.83)	(3.83)	(3.52)	
_cons	-0.0359	-0.0359	-0.0167	-0.161***
	(-1.00)	(-1.00)	(-0.50)	(-5.48)
N	344	344	344	344

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

7 Robustness Check

We use various kinds of specification forms to check that how sensitive our results are to the regression specification.

For the first regression that yields result for hypothesis 1-4. We check robustness using several versions of regression specification forms. We check results each time we drop a control variable: CFEER, TA,$\triangle GDP$, LLA and dummies for categories of banks. The regression results are robust to such modifications of regression specification: the coefficients of key variables keep their sign, although in two cases the P-value of coefficient of Listed*MCAP is around 0.051, slightly above 5 percent. However, the regression results are very sensitive to both the inclusion of sample fixed effect and time fixed effect. Dropping time fixed effect makes coefficient of Listed* MCAP insignificant and dropping sample fixed effect makes coefficients of all key variables insignificant. Our argument here is that sample fixed effect is necessary in that it capture the difference in asset quality among commercial banks: the proportion of non-loan asset, proportion of each categories of loans made and customer sources. To control for such difference we only include CFEER to approximate the extent to which banks engage in non-loan service; data of loan structure and customer sources is lacked. So sample fixed effect is necessary. As for time fixed effect, they are necessary in that they capture the regulatory cycle: commercial banks decrease their loan loss cover ratio under the forbearance of regulators as shown in graph above and one of the important path to decrease loan loss cover ratio is to decrease discretionary loan loss provisions in that periods. As regulators set different target loan loss cover ratio for commercial banks in each year in response to the change of banking and macroeconomic conditions. Such impact of regulatory change may be correlated with earnings and capital level of banks and may be idiosyncratic for banks of different size or different categories. So dropping time dummy may bring endogenous problems.

In our discussion of the result of first regression for reasons why the coefficient of Listed*MCAP is negative. We mention that one potential explanation is that public banks can raise equity through capital market and another potential explanation is that they are more influenced by regulatory cycle. But if it is due to regulatory influence, it is more likely the case that large banks, rather than public banks, are less sensitive to capital ratio when making loan loss provisions since large banks are important in the economic system because they supply most credit and are systemically important. One fact that must be mentioned here is that most of public banks are large banks. We want to make sure that the negative coefficient of Listed*EBT in our regression arises not because most of listed banks are, by chance, large banks. If this is the case, then our conclusions needs change. We introduce dummy N to indicate that banks whose asset size are among top 25% in our sample, a group comparable in size to public banks. We include variable $N * EBT$ to our regression form and deduct some variables not of interest while keep all control variables.

$$
\begin{aligned}
LLPR = \beta_0 + \beta_1 Jointstock + \beta_2 Rural + \beta_3 City + \beta_4 LLA + \beta_5 TA \\
+ \beta_6 \triangle GDP + \beta_7 CFEER + \beta_8 EBT + \beta_9 MCAP + \beta_{10} Listed \\
+ \beta_{11} N * EBT + \beta_{12} Listed * EBT + \beta_{13} I.Bank + \beta_{14} I.Years
\end{aligned}
$$

The regression result shows that the coefficient of N*EBT is not only insignificant but also positive. The coefficient of Listed*EBT remains significantly negative. This results show that listed banks, rather than large banks, are less inclined to engage in capital management. So the fact that public banks can efficiently raise equity from capital market plays a more important role.

	(1)
	LLPR
Jointstock	0.0151
	(1.72)
Rural	0.00425
	(0.29)
City	0.00308
	(0.21)
LLA	0.0933***
	(3.37)
TA	0.000536
	(0.11)
$\triangle GDP$	0.000314
	(0.89)
CFEER	0.480
	(1.63)
EBT	0.797***
	(7.53)
MCAP	0.0000409**
	(2.85)
Listed	0.00898
	(1.64)
*N*MCAP*	0.0000679
	(0.33)
*Listed*MCAP*	-0.000833*
	(-2.02)
2011.years	-0.000628
	(-0.60)
2012.years	0.000177
	(0.12)
2013.years	0.000946
	(0.54)
2014.years	0.00280
	(1.31)
2015.years	0.00826**
	(3.27)
_cons	-0.0254
	(-0.69)
N	348

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

For research on hypothesis 6, the regression result is robust to dropping any one of controlling variables or fixed sample and time dummy variables. As listed banks are more likely to issue debt, we want to make sure that our result is not biased by such facts: if bond issuance sample is overrepresented by public banks,

our coefficient may actually reflect such relationship that public banks are less inclined to engage in capital management We use all samples of private banks and run regression–the result for key variables remain robust. So our regression result is not likely to result from bias.

8 Conclusions

We use a series of regressions to examine how the public or private status and seasonal issuance of equity bond impact the capital and earnings management incentives of commercial banks.

We obtain evidence that private banks engage in capital and earnings management. Public banks, however, contrary to prevalent opinions, do not use loan loss provisions to engage in earnings management more aggressively than private banks and are found to lack motives to manage capital levels using loan loss provisions. We also find that public banks decrease discretionary loan loss provisions to boost their earnings before seasonal stock offerings and low regulatory capital banks tend to increase loan loss provisions to signify their stability before bond issuance. However, we do not find a very convincing reason to explain such pattern before bond issuance.

Since we only have ORBIS corporate database and do not have ORBIS bank focus data, some of important data are not obtainable. For example, we do not have data on loan structure of banks are relevant to riskiness of loan made. The denominator of regulatory capital can not be calculated so we use lagged capital ratio rather than capital ratio before loan loss provisions when examining motives of capital management. The influence of regulators are abstracted into time dummies, a careful examination is needed to explore the impact of issued regulatory documents of banks in this periods. From the angle of methodology, a more carefully designed research that makes use of some exogenous variation of influence of loan loss provisions is necessary to help disentangle incentives of capital management and earning management as literatures that focus on change of incentives to use loan loss provisions pre-Basel and post-Basel period due to the change in composition of key capital ratio.

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