Accounting & Finance, Erasmus School of Economics Academic Year 2008/09

GRADUATE THESIS

Account Management on Loan Loss Provisions for Signaling in two Banking Groups in the United States

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Rotterdam. September, 2009

Abstract

This paper examines the signaling effect of bank managers' adjustment on loan loss provisions with the sample of bank holding companies and commercial banks in the United States in the period of 1997-2008.

In line with prior studies on account management, this study decomposes the total accrual of loan loss provisions into non-discretionary components and discretionary components. Particularly, I predict in two hypotheses that the adjustment on loan loss provisions is supposed to signal the situations about future earnings and external debts. For the variables used in the linear model, data are collected from the annual reports of the sample banks, which are available in the BankScope database (Bureau van Dijk).

In terms of the two pooled regressions, the results indicate that loan loss provisions are (1) positively related to the changes in one-year-ahead earnings at commercial banks; (2) not related to the borrowed funds in either banking organizations. Generally, the facts about signaling effect do not vary much among the two banking groups and the current crisis appears irrelevant to the management of loan loss provisions so far.

Overall, this paper suggests that rather than future earnings or external finances, the underlying aspects that managers intend to signal about banks to stakeholders need to be examined further.

Acknowledge

I would like to thank Dr. Wang, Yue as my thesis supervisor and Dr. Guah, Matthew W. as the co-reader. I am also grateful to all the professors and classmates I met at Erasmus University Rotterdam during this academic year.

Last but not least, I do appreciate the supports from my parents all the time.

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1. Introduction

1.1 Overview

In the field of financial accounting 'loan loss provisions' emerges to be one of the most popular terms in recent decades. In workplaces its popularity is not an incidental phenomenon because loan loss provisions, like all the other accruals that are subject to managerial discretions, provide managers the opportunity to adjust accounting numbers in reports whilst not violating accounting guidelines. In the view of researchers, the manipulation of loan loss provision contributes to be a feasible measure of account management and is therefore widely employed in research papers.

Prior researches on account manipulation concentrate on: (1) evidence and incentives of account manipulating activities (Wetmore & Brick 1994; Beaver & Engel, 1996; Burgstahler & Dichev 1997; Anandarajan, et al., 2007); (2) accruals that mangers use to manipulate reported numbers (McNichols & Wilson, 1988; Kanagaretnam et al. 2004; 2005); (3) accounting practices in different regions (Hasen & Wall, 2003; Anandarajan, et al., 2005; Agusman et al., 2008); (4) the impact of a new guideline or an economic crisis on accounting systems (Kim & Kross, 1998; Ahmed et al.,1999; Rivard, et al., 2003). In sum there exist no sharp boundaries between each issue and their representative papers; instead, most of them are focused on more than one issue.

Concerning the accounting practices in the U.S. banking sector, this paper examines account management from the perspective of signaling effect and the loan loss provision is the device of account management. Supposedly, the level of loan loss provisions in bank reports are affected by a series of determinants and the signals about banks are thus sent to stakeholders via the loan loss provisions manipulated by managers. Particularly, I select two groups of U.S. banks, of which one group represents typical banks, e.g. commercial banks[1] and saving

[1] "A financial institution that is owned by stockholders, operates for a profit, and engages in various lending activities." Source: Federal Financial Institutions Examination Council (FFIEC), last updated in June 2009.

banks[2] and the other represents the emerging banking entities, e.g. bank holding companies[3] and credit unions[4]. The research objective is firstly to find out whether the explanatory factors empirically developed in prior papers make the same effects on the samples here. And, to what extent the linear relations are supported comes to be the second concern, either there reveals lots of variations between groups because of the distinctive banking practices among groups, or all the sample entities act to adjust accruals in a similar manner because of the highly standardized guidelines.

1.2 Problem statement

Discords arise on the extent of managerial discretions due to that the discretion is hardly to be quantified or standardized but completely depends on managers themselves; in other words, concerning the manipulation of loan loss provisions, the situation is rather asymmetric between managers and outsiders[5] and the interest of either side may be hurt in such an asymmetric situation. In order to break the asymmetry, managers (as the sender) are always supposed to broadcast the information in their expected way as to persuade stakeholders (as the receiver) to favor the concerned entities. Briefly, 'signaling' activities refers to the manipulation of accounts done by managers as to send expectant information to expectant stakeholders.

Attributed to the accrual nature of loan loss provisions, on one hand managers are allowed to adjust the provisions, and on the other hand stakeholders can easily observe the changes of the

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[2] "Banking institution organized to encourage thrift by paying interest dividends on savings. Savings banks can have state and federal affiliations, for example, State Savings Banks and Federal Savings Banks." Source: FFIEC, June 2009.

[3] "A company that owns and/or controls one or more U.S. banks or one that owns, or has controlling interest in, one or more banks. The Board of Governors is responsible for regulating and supervising bank holding companies, even if the bank owned by the holding company is under the primary supervision of a different federal agency (OCC or FDIC)." Source: FFIEC, June 2009.

[4] "Financial cooperative organization of individuals with a common affiliation: credit unions can have federal, state, or corporate affiliations." Source: FFIEC, June 2009.

[5] They may not be physically outside the entity of banks, e.g. the in-door shareholders, but blocked from the information to which only managers have access.

provisions in annual reports – in doing so, the information is exchanged from one side to the other; i.e. the signal about banks has been sent. Consistent with the 'white' theory[6] proposed in Ronen and Yaari (2008), managers send signals as to inform the strengths of banks and stakeholders in return are attracted by the signals to unload their investments – if so, the signaling effect has been realized via the changes in loan loss provisions.

In practices, the manipulation of loan loss provisions for signaling purposes more or less exists in every bank's annual report and as more types of banking entities come into sight in the recent decades, this issue becomes even subtler: compared with typical banks, emerging banks and banking entities are required to obey less rigid requirements so as to obtain great flexibility in arranging capitals[7]. Although the special settings in emerging banks facilitate their banking activities, risks may be magnified as well in certain conditions; as evidence in reality, 'shadow banking system' is accused by Jickling (2009) as one cause of the current credit crisis for that some mortgage loans 'in particular moved out of banks into unregulated institutions.' (p4)

Furthermore, because emerging banks are more like the hybrid of banks and firms, the composition of stakeholders will be more discrete to consider, i.e. more disparate readers of banks' published reports when referring to signaling effect. In consequence, the managers of emerging banks are even more likely to engage in signaling via accruals than at typical banks. Hence, to look into the new banking entities, particularly with typical banks compared in parallel, is quite likely to bring a fresh flow of insights to the studies on accounts management.

Given this rationale, the main question is formed and should be answered in the end that:

Provided that loan loss provisions are manipulated by managers to signal banks, does the

[6] Briefly, the theory states that the management of accounts could be beneficial (white), pernicious (black) or 'either either opportunistic or efficiency enhancing' (grey) (Ronen and Yaari, 2008; p.25-27).

[7] Similar opinions can be read in Madrick (2009) that 'shadow banking system in effect made the loans, but unlike commercial banks, which have reserve and capital requirements legally imposed upon them for activities on their balance sheets, and are also subject to Federal Reserve scrutiny, its capacity to borrow was by and large unrestricted.' (p.4)

signaling effect exist in the U.S. banking sector and what are the factors responsible for the changes of discretionary loan loss provisions?

In order to facilitate the research, sub-questions include:

- Provided that signaling effect is the purpose of accruals adjustment, what could be the relevant factors that affect the adjustment of loan loss provisions and to what extent?
- Which aspects of banks managers intend to signal to stakeholders?
- In terms of different bank groups, does the fact of adjustments on loan loss provisions vary between groups and to what extent?
- Due to the current credit crunch, will the results change if 2007 and 2008 are excluded from the sample period as to eliminate the impact of recession on banking entities? And to what extent the changes should be taken into account?

1.3 Motivation

Although the use of accruals for signaling effect has been discussed extensively in prior papers, this paper should be contributive for these reasons:

Firstly, due to the fact that the financial market at present is inevitably based on credit transactions and loans at banks count a large part of the market, to predict, prepare and adjust provisions against loan losses comes to be a never-ending issue to banks managers; so does the research on loan loss provisions.

Secondly, I choose to focus on the signaling effect of managing accruals because future earnings and external debts are the fundamental aspects of banks that managers will need signal but existing studies show mixed evidences. Concerning the current crisis, the interventional activities that banks are taking as to 'signal' themselves should be meaningful to think about.

Thirdly, the sample choice of U.S. banks might be queried as 'lack of initiative', but it is justified for that (1) based on the sample region, the results generated in this paper are thus comparable to the results of many prior papers; (2) the U.S. banking sector is well-developed

so that various bank groups can be found and employed in research; and (3) attributed to the particular status of this economy, banks and banking activities in the rest of the world are unavoidably influenced by the U.S. scheme.

The main content of this paper is organized as follows. Chapter 2 briefly introduces several features of the American banking sector. Chapter 3 firstly reviews the literature on account management and then reviews the literature on signaling effect. Chapter 4 develops a pair of hypotheses. Chapter 5 elaborates the linear model and regressions to be used in analyses. Chapter 6 describes the sample-selecting process and gives a numerical overview of the sample sector. Chapter 7 provides the results, interpretations and limitations. In the end, Chapter 8 concludes the whole paper and also suggests certain directions for further research.

2. Background

This chapter provides a brief description of the U.S. banking sector in terms of the industrial structure, distribution of banking entities, and particularly the historical trend in certain accounts. Correspondingly, several figures are presented to reveal the industrial facts.

Concisely, this banking sector is endorsed by Federal Reserve System (FRS), Federal Deposit Insurance Corporation (FDIC) and Office of the Comptroller of the Currency (OCC). The FRS actually means the entire banking system and all the institutions involved as parts of the system; the FDIC, as the federal agency, is mainly known as to insure commercial banks, saving banks and other emerging types of institutions (e.g., credit unions, bank holding companies, etc.) that are considerably close to domestic markets and consumers; as to the OCC, it is the other federal agency, in charge of national banks and foreign-bank branches in the local market. These federal mechanisms in principle regulate and standardize the group of banks and banking entities, which precisely provide plenty of data and information to be sampled in empirical papers.

Beside the institutional regulators, another main feature of the banking sector is its industrial structure, i.e. the types of banks and banking entities and the share of each type in the entire sector. Jones and Crithfield (2008) ever predict that the U.S. banking industry is likely to 'retain a structure characterized by several thousand very small to medium-size community bank organizations, a less-numerous group of mid-size regional organizations, and a handful of extremely large multi-national banking organizations' (p.78). Probably due to the global crisis emerged in the second half of 2007, the reality however deviates a lot from the authors' perspective: the first two groups are either run out of business or converted into other corporate forms, while huge funds from the federal government are injected into the third group in order to cure the insolvency there – no wonder those banking charters are sometimes criticized as 'being nationalized' (Quinn, 2009).

- Figure 1. Distribution of banks by assets in five years -

According to Figure 1, the American banking sector tends to be more and more dominated by

the group of giant banking corporations in terms of total assets. The dramatic example is seen in the year of 2008 when the top 500 banks[8] only include the banks with total assets of over US$10 billion while all the other groups have disappeared – one possible explanation could be that a quantity of banking organizations are currently in transitions so it is hard to get access to their data on real-time basis as to sort them at present. Also, there is a tendency that the medium-size banks, i.e., banks with total assets from US$150 million up to US$10 billion, regularly fall out of the top banking group, probably because that not a few of medium banks have been merged into larger entities so as to tackle the ongoing crisis, which also explains why the total number of banks are largely decreased in latest years.

- Figure 2. Distribution of banks by status during 1995-2008 -

Instead of sorting banks by assets, Figure 2 indicates the trend of banks in terms of their status and the year of 2005 is labeled as the water-shed: the group of active banks progressively increases and reaches a peak in 2005, while the number of dissolved[9] banks is approximately constant before that year. After that, both active banks and dissolved banks are in decline; in other words, the banking sector starts to stagnate from that time. Besides, as suggested by the little quantity of bankrupt banks, to be bankrupted appears rather irrelevant to those first-class banks, which is well known as 'too big to fail' to the common people.

- Figure 3. Changes in loan loss provisions during 1995-2008 -

Regarding the theme of this study, the historical change of loan loss provisions should be taken into account. In Figure 3 the changes in loan loss provision over time are respectively drawn for active banks (upper) and dissolved banks. Both types of banks are found with modest increases in their loan loss provisions before the new millennium. After that, the active banks regularly increase their loan loss provisions in the early 2000s, possibly due to the fears of the dot-com crisis at that time. Then as the economy recovers, the use of loan loss

[8] The ranking is made with the BankScope data; specifically, all the banks in the U.S. are ranked in terms of total assets.

[9] In particular, the term 'dissolved banks' means those banks in liquidation, in merger or demerger, which after all is one kind of transition in order to reactivate banks.

provisions appears less important to either bank type until this credit crunch emerges a couple of years ago: the active banks tremendously increase their loan loss provision while the dissolved banks seem to give up their provision accounts afterwards.

The fluctuation presented in Figure 3 suggest that (1) the amount of provisions in the current period is accumulated from that of prior periods (i.e. the actual increase in each period may not be as large as seen in the figure); (2) to support banks against unfavorable economies comes to the most possible concern to account for the change in loan loss provisions; and (3) in terms of the observable practices on loan loss provisions, active banks tend to be more representative samples than in-transition banks.

- Figure 4. ROE ratio vs. impaired loan ratio during 1995-2008 -

Besides, two ratios are selected to represent the profitability and the loan quality of banks respectively, returns on average equity (ROE) and impaired loans to equity (IL/E). Not surprisingly, the trend seen above confirms that the banking industry is severely influenced by the fluctuation of economic conditions. The two lines are extending in opposite directions for most periods and particularly from the late year of 2006, the ROE line (upper) sharply turns down while the IL/E line unfortunately rises upward. In other words, the banking sector solely goes worse and lasts till present. Besides, comparing the IL/E line with the upper line in Figure 3, their trends are very alike, which on one hand proves the loan-related accounts of banks are no doubt affected by economic conditions and on the other hand reveals the correlation between impaired loans and loan loss provisions - as seen later in Section 5.1, the IL/E is employed as a control variable of the loan loss provisions.

3. Literature Review

Before the intensive reviews, two key terms need to be clarified in beginning, ‘account management’ and ‘loan loss provisions’.

In general, accounts management is defined as ‘the use of management’s discretion to make accounting choices or to design transactions so as to affect the possibilities of wealth transfer between the company and society (political costs), funds providers (cost of capital) or managers (compensations plans).’ (Stlowy & Breten, 2004; p.6) It is commonly interpreted as managers manipulate reported accounts for certain purposes, such as earnings management, income smoothing, capital management, and signaling effect. As to this paper, the account manipulation refers to the signaling activities done by mangers via the changes in certain accounts, assuming that the market is efficient so stakeholders are able to perceive the signals sent by managers via the published reports.

The loan loss provision is an accrual account prepared against potential loan losses. Its amount is used in calculating the loan loss reserves in each period end in balance sheet, together with the beginning loan loss reserves, the write-offs of loans that are less likely to be repaid, and some unexpected recoveries from debtors (Walter, 1991; p.22). In income statement, the amount of provisions itself is estimated by managers with discretions and is part of the expenses that influence the operating profit and the published net income. Here in this study, the managerial discretion on loan loss provisions is thought to be mainly affected by the information that managers have about the banking entities and to which aspects of banks the information is related comes to be the concern.

In this chapter I select a bracket of prior studies to present the main research issues on account management; after broadly reviewing the main issues, the papers particularly on signaling effect are then reviewed in subordinate sections.

3.1 Studies on account management

3.1.1 Existence

In the very beginning, it is a controversial discussion on whether the account manipulation does exist in banking practices: proponents state that management with discretion is justified due to the unpredictable reality and the managerial discretions are driven by particular incentives, while dissenters argue that managers adjust accounts in line with bank conditions is merely a corporate routine, not for any special purposes and the effect of 'inside information' has been overestimated.

Consistent with the viewpoint of proponents, managers engage in accounts manipulation on purpose and the particular accounts manipulations include earnings management, income smoothing, capital management, and signaling effect. One common point of prior researchers is to find the evidence about whether a certain kind of account manipulation exists or not; e.g. income smoothing - suppose that managers may adjust accounts in order to stabilize incomes, three representative papers are reviewed below.

Beaver and Engle (1996) employ the account of loan loss provisions in the large publicly traded banks in the United States during the period of 1977-1991. After compare the net income before and after loan loss provisions, the authors find that the level of provisions is positively related to the fluctuation of net income and the existence of income smoothing is thus supported. As to Rivard et al. (2003), the authors also employ the loan loss provisions and form the sample with large bank holding companies in the United States. In their conclusions, to smooth incomes via loan loss provisions is confirmed with the data of early 1990s and the evidence is supported once again. Wetmore and Brick (1994) hypothesize the relation between loan loss provisions and pre-tax incomes in the sample of commercial banks in the United States during 1986-1990. On the contrary of previous papers, the results indicate that the income-smoothing hypothesis does not hold so that no evidence of income smoothing is found in that paper.

In sum, prior papers may have incongruence on the purposes for which managers manipulate accounts but the existence of account manipulation is commonly supported in many papers (Ma, 1988; Collins et al., 1995; Beaver & Engle, 1996; Rivard et al., 2003; Pérez et al., 2008); that is to say, the evidence of account management has been exogenously confirmed but the incentives behind remain to be answered in each particular paper.

3.1.2 Incentives

The possible reasons that motivate managers to manipulate accounts could be: to broadcast/hide[10] the information that managers have superior to others (Schipper, 1989; Leuz et al, 2003), to behave in line with the mechanism of corporate government (Cornett et al, 2009), to alter the level of capitals[11], earnings, and incomes on behalf of banks (Betty et al, 1995; Ahmed et al., 1999; Rivard, et al. 2003), to adhere to industrial rules and international guidelines (Kim & Kross, 1998; Laeven & Majnoni, 2003; Pérez, et al, 2008), etc.

Schipper (1989) proposes the term 'information perspective', presuming the 'private information' (p.93) that only managers have access to. As a result, stakeholders may fail to completely estimate the situation about banks and then move out their investments; so as to managers, they need to work on the reported accounts for more information transparency. Contrarily, Leuz et al. (2003) argue that the reason for which managers manipulate accounts is to 'conceal' the inside information from unexpected outsiders since being less transparent to the outside does count a comparative advantage.

Instead of the inside information, the structures of organizations is another incentive to encourage managers to manipulate accounts. Cornett et al. (2009) examine earnings management related to the features of corporate governance, e.g. broad independence that a relatively dependent broad means that managers participate in the broad of directors as well.

[10] As to this paper, by using the term 'signaling effect', I refer to the 'broadcast' incentive that managers manipulate loan loss provisions in order to enhance the information communication to stakeholders.

[11] Regarding the guidelines which define capitals, the capital incentive can be viewed as the regulation incentive, too.

The authors suggest that more participation in the board motivates managers more to be active in earning management on behalf of their organizations (p.426).

Besides, managers are likely to manipulate accounts in order to alter certain crucial numbers in report, e.g. sales revenues, earnings, pre-tax incomes, etc. In particular, one main trend is to stabilize the flow of incomes because stakeholders are usually volatility-averse. Rivard et al. (2003) describes that managers estimate lower loan loss provisions to increase earnings (p.289). Fonseca and González (2008) also states that bank managers are found to use loan loss provisions to smooth incomes.

Broadly, the account manipulations may be driven by various compulsory regulations. In terms of the Basel Accord 1988, Kim and Kross (1998) state that 'before (after) 1989, recognition of loan Loss provisions increased (decreased) the regulatory capital' (p.70). Pérez, et al (2008) mention that 'bank managers have incentives to use loan loss provisions to alter regulatory capital ratios' in the framework of Basel I. Accordingly, as regulations change, the incentives behind accounts manipulation will be varying as well.

3.1.3 Accruals

Accruals are commonly used by managers to manipulate accounts because the accruals booked in accounting reports depends on the recognition of transactions and quite a fraction of accruals are determined by managers with discretion. Recall the papers in which accruals are employed in research: bad debt provisions in McNichols and Wilson (1988); loan loss provisions in Ahmed et al.(1998), Kim and Kross (1998), and Eng and Nabar (2007); and loan loss reserves in Agusman et al.(2008). Basically, these accruals are the same in terms of their effect on hedging losses, while the branch point is on the places where they can be read in annual reports, in balance sheet or income statement.

Besides, researchers who employ accruals tend to discompose the total amount of accruals into two components: the non-discretionary component and the discretionary component (Ma, 1988; Beaver & Engel, 1996; Lobo & Yang, 2001; Kanagaretnam et al., 2004). The notion

behind is that, after controlling the nondiscretionary component of the total accrual, the residual that stands for the discretionary component can be estimated by several explanatory factors, and then each linear relation, i.e. whether a certain factor is relevant to the adjustment on accruals, is tested exist or not.

Overall, many researchers on accounts manipulation examine accruals as many managers use accruals to exercise discretion. In addition, a few researchers choose to examine cash flows as the alternative of accruals. Burgstahler and Dichev (1997) find that managers in firms manipulate operating cash flows and working capitals to dress up earnings. Roychowdhury (2006) uses 'cash flow from operations' to measure the real activities manipulation and proves that firms do engage in the adjustment of cash flows 'to avoid losses' (p.336).

3.1.4 Sample settings

Firstly, this section focuses on the review of country-specific studies. Due to the process of industrialization, the early-industrialized countries also develop their financial systems in the front. Therefore, for the researchers on account management, these countries are frequently used to collect samples; particularly, the U.S.-based research (Wetmore & Brick, 1994; Beaver & Engle, 1996; Ahmed et al., 1999; Rivard et al., 2003; Cornett et al., 2009) evolves to be the trendy choice in quite a long period.

Instead, some researchers choose to set their samples outside the border of United States, e.g., Petroni et al.(2000) and Pérez et al.(2008), of which the sample contains Spanish banks only; and Agusman et al.(2008) in which the practices of Asian banks are investigated. In doing so, these authors investigate the accounting practices in relatively unknown places and their papers considerably enrich the research on accounts manipulation.

In between the studies which are either based on the United States or on non-U.S regions, Hasan and Wall (2003) use a sample containing of both U.S. banks and non-U.S. banks and suppose the results should be explained by country-specific features to much extent. But in fact the authors find that the relation between loan loss reserves and account management

merely depends on the capital level and it does not vary a lot between different sample countries. One possible cause could be that the sample contains developed countries only, in which the capitals at banks are highly standardized and frequently exchanged between each other; that is to say, the sample countries are unfortunately alike in terms of bank capitals.

Consequently, it implies that the comparison between similar countries may fail to generate country-related results. On the other hand, when researchers attempt to compare distinctive countries, i.e. the mechanisms, economic practices and social atmosphere are extremely different, it may be criticized as well; since in that way, even if significant variances are found between sample countries, the result is probably related to other explanations rather than accounting practices. After all, it would not be easy for researchers to select the sample countries whose differences have to be sufficiently significant and compatible in context.

Secondly, concerning the sample period, researchers face two options: either to set a certain time horizon or to focus on an event happened in a particular year, e.g., the launch of Basel Accord in 1988.

With respect to the introduction of Basel Accord, Kim and Kross (1998) separate the sample period of 1985-1992 into halves and investigate the impact of new capital schemes on loan loss provisions. As a result, banks which used to have difficulties to meet capital requirements are found to manipulate loan loss provisions less in the second-half period (after Basel Accord) than before, for that 'the change in the capital standards in 1989 substantially excluded this allowance from regulatory capital' (p.70)[12], while the banks with highly sufficient capitals as always appear not to be influenced by the new accord. Likewise, Ahmed et al.(1999) use a sample of bank holding companies in the period of 1986-1995 and split up the sample period. They also find that the manipulation on loan loss provisions 'has declined' (p.15) after adopting the new definition of regulatory capital.

[12] As described in the beginning of this chapter, the amount of loan loss provisions is actually included in the sum of loan loss reserves (as 'loan loss allowances' in some places) of each period, so if loan loss reserves are excluded from the regulatory capital, to adjust loan loss provisions does not help improve the capital ratio any more.

In addition to the previous two papers on capital management, Rivard et al. (2003) examine the impact of Basel Accord on income smoothing and instead of employing two sub-periods, the authors only use the period after Basel Accord, i.e. 1992-1997. In the end it is found that banks tend to manage loan loss provisions more, because according to the new capital scheme the changes of loan loss provisions does not affect the level of regulatory capital at banks any longer so that bank managers can have more freedom to adjust provisions to stabilize reported incomes.

3.2 Studies on signaling effect

After reviewing the prior papers about account management, this section is built up on the papers directed on the signaling effect of managing accruals.

From the viewpoint of managers, they manage certain accounts so as to send signals in the way that comforts a certain side of interest. E.g. in order to comfort shareholders, managers need to show that a series of higher earnings is coming to the banks in near future; if such an increase of earnings is known in advance by managers, they will increase loan loss provisions to maintain the stableness of earnings in general. In doing so, the managers actually send the signal of higher earnings to the shareholders in the form of increased loan loss provisions. Concerning the main sides of bank stakeholders, the signaling flow is structured in Figure 5.

- Figure 5. Framework -

Because in most cases the profitability and the quality of loans at banks are the primary concerns of stakeholders, bank managers change loan loss provisions as to disclose the future earnings on one hand and to show the situation of external finances on the other hand. So in research, the explanatory factors used to examine on signaling effect are usually related to these two aspects of banks, e.g. the next-period earnings, non-performing loans, write-offs, borrowed funds and so forth. In the sub-sections below, several papers are discussed to highlight the importance of signaling activities in the banking sector.

3.2.1 Signal for future profitability

As reviewed in Section 3.1.3, the researchers on loan loss provisions usually divide the total accrual into the non-discretionary (proportional) component and the discretionary (unexpected or unpredicted) component. And, to test the relation between the unexpected component of loan loss provisions and banks' future earnings comes to be one main task. In particular, the paper of Wahlen (1994) is considered as one precursory research in this field. The author uses a sample of commercial banks in the 1980s and looks into the future earnings of banks respectively in one, two and three years ahead in order to see the change in which-year-ahead earnings are most related to the manipulation of loan loss provisions. As a result, it turns out that the relation is significant and positive only when using the one-year-ahead data.

Besides, Wahlen tests how the market prices the discretionary components of loan loss provisions, which can also be seen in Beaver and Engel (1996). Both papers employ the stock returns of banks as an independent variable and the loan loss provisions as the dependent variable; if the relation between the two variables are positive, it means that the market view the increases on loan loss provisions as a piece of good news related to banks' future profit.

However, the stock-based approach is not found as much popular as the earnings-based approach in empirical papers. Because the first approach requires the sample entities must to be publicly traded and the market prices of stocks exist, it however may restrict the types of financial entities which can be investigated in research. On the contrary, by using the second approach, the authors can simply collect the data from banks' annual reports and no need to ensure that the accounts are measured in market value. Indeed, many researchers employ the variable of one-year-ahead earnings, e.g. Ahmed et al. (1999), Lobo and Yang (2001), and Anandarajan et al. (2007).

Ahmed et al. (1999) analyze the annual data of 116 bank holding companies during 1986-1995 and find that the adjustment on loan loss provisions is negatively related to the change of one-year-ahead earnings. Particularly, the authors interpret that the conflicts between their paper and the paper of Wahlen (1994) are possibly driven by the choice of sample periods: the fact of signaling effect can be differed as time goes by. Later Lobo and

Yang (2001) proves that the relation is positive once again but it does not hold without conditions: such a positive relation can be identified only when bank-specific regressions are used, rather than year-specific regressions or pooled regressions. Then in recent, based on the facts of 50 commercial banks in Australia, Anandarajan et al.(2007) conclude that no signaling effect exists of the changes on loan loss provisions.

So far the concern of these papers is on developed countries only while there are other papers in which the authors carried out their research in the field of emerging economics, e.g., the banks and the financial entities in Asia. Eng and Nabar (2007) conduct a research into the financial system in Southeast Asia in the period of 1993-2000. Probably because of the pan-Asia crisis of 1998, the linearity between provisions and future cash flows fails to be found with the observations collected from the crisis years.

3.2.2 Signal for external debts

This sub-section discusses another research stem on signaling effect, which supposes that the adjustment on accounting accruals is thought relevant to banks' financing situation. Begley (1990) examines how the leverage level in firms is determined concerning the debt covenants. The author states that 'after controlling for the existence of covenants, leverage remains significant in explaining accounting method choice, indicating that leverage is proxy for closeness to covenants' (p.136). Provided that all firms have similar debt covenants to meet, firms with a relatively high leverage, i.e. have the tendency to violate covenants, are observed to adjust more accruals to avoid violating rules (p.126-127).

In principle, financial covenants are developed to regulate the tension among banks and bank stakeholders and in most cases all the involved parties choose to comply with the covenants for their own good. However in certain cases banks 'have to' violate covenants for reasons: when banks confront capital shortages, managers could issue bonds as a counter-measure. Yet in doing so, a large amount of debts are increased in reports, which may cause banks to violate certain covenants, e.g. the covenant which defines the maximum leverage (debt to

equity ratio).

According to Clifford and Smith (1993), the example above is termed as a violation against 'affirmative covenants'[13] and firms are found more frequently violating affirmative covenants rather than negative covenants (p.292). Hence, it is rationale to infer that once firms have anticipated trouble in approaching a required ratio, they may adjust some accounts to remedy. In doing that, the firms violate the affirmative covenant since that some accounts have been manipulated while the negative covenant (i.e. the required ratio) is left safe. Thinking of the possibility that banks may manipulate accounts for their own interests, the stakeholders are motivated to grasp the information about banks as much as possible in order to prevent their related covenants from being sacrificed. In fact, the information pursued by stakeholders is usually signaled by managers in particular forms.

With that rationale, Goswami et al. (1995) make research about the information signaled by the methods on which firms obtain external funds. The paper examines a set of bonds with different term structures (time length to mature) and conclude that long-term debts appear to have 'better' signaling effect than other financing methods (p.636). In specific terms, normally long-term debts are preferred by financial entities in issuing bonds since this kind of debts is economical and easy to maintain; but in order to issue long-term debts, lots of criteria have to be met in the first place. As a conclusion, the reluctance toward long-term debts could be considered as an indicator about firms' troublesome situation. Even importantly, it is confirmed to some extent that the financing choice made by insiders does send signals to outsiders.

[13] Clifford and Smith (1993) state in their paper that 'negative covenants restrict the payment of dividends, the disposition of assets, the issuance of additional debt, and merger activity; affirmative covenants specify minimum working capital and net worth requirements.' (p.290)

4. Hypotheses Development

This paper focuses on the signaling effect of manipulating loan loss provisions in banking industry. By the term 'signaling effect', the research is oriented to the managerial behaviors at banks, the perspectives of stakeholders towards those behaviors and most importantly the interactions between the managers and the stakeholders.

First of all, it is presumed that bank managers have access to the inside-bank information which bank stakeholders do not have. Attributed to the specific information, bank managers are able to foresee the underlying changes of banks, e.g. higher earnings, more funds in need, potential investment projects and so forth. Once any of these changes is seen as the strength about banks, managers will arrange more loan loss provisions to signal it to stakeholders, by which process the (discretionary changes of) loan loss provisions become the signaling tool to bank mangers.

Then the question turns that what are the crucial aspects of banks involved in the signaling activities, in other words, the underlying changes that managers can foresee and intend to signal on behalf of banks. As discussed in Chapter 3, the profitability and the external finances of banks come out to be the two crucial aspects in terms of stakeholders' concern. So basically, the hypotheses in the next are specified on the relation between the level of loan loss provisions and either of the two aspects.

As to the bank profitability, the account of earnings is considered as the representative. Increasing earnings mean more funds available to banks to carry out various financial activities, e.g. to lend more loans and get repaid with cumulated funds at maturity. Also, to the viewpoint of bank shareholders, the upward flow of earnings is definitely welcomed. Therefore, when managers anticipate that the bank earnings are going to rise in recent periods, they will signal the trend to the public as one comparative advantage of banks.

In line with prior papers (Ahmed et al., 1999; Lobo & Yang, 2001; Anandarajan et al., 2007), the change in one-year-ahead earnings is used to measure the trend of bank earnings: when the change is positive, it means that the earnings in the next year will increase compared with

the current year. Because loan loss provisions in income statement are earnings-decreasing accruals, managers are likely to increase the provisions as the signaling tool in correspondence to the increased earnings of the next year.

Hence, the sequence hypothesis predicts that:

H1: *Discretionary loan loss provisions are positively related to one-year-ahead changes in earnings before taxes and loan loss provisions*.

Along with bonds and stocks flowed into banks, bank managers need to take care of many sides of creditors. One way to do so is to maintain certain accounts as satisfactory as the creditors expect: for stockholders, managers have to show that the banks have stable earnings all the time; for bondholders, managers will need to convince them with plenty of cash flows.

Considering the signaling effect of reported accounts, managers may understate some liabilities if they consider a large amount of external debts as the weakness of banks. Yet it can be viewed as the strength of banks in certain situations: when banks have great growing potentials, e.g. having a bundle of investment projects while lack of funds to invest on their own, bank managers may turn to borrow funds from the external and re-invest the funds in those projects. In doing so, although the annual report of banks is read with a large number of borrowed funds, it does not mean a piece of unfavorable news to stakeholders after they know the external funds have been injected to banks. Thus, as long as managers have confident in re-investing the borrowed funds of banks, they are encouraged to signal their real financing situations to the outside. By using loan loss provisions as the signaling tool, a higher level of (discretionary) provisions should be found in consistence with the situation that banks acquire a large number of external debts.

In particular, Kanagaretnam et al. (2004) propose a particular variable, ‘loans to deposits ratio’, to represent banks’ demand for external financing in their signaling-oriented research and predict that banks tend to use more loan loss provision when they have greater needs for external funds. In terms of the regression results, the hypothesized relation is confirmed

(p.131; p.135) that if banks are more in need of external funds, they will be observed to adjust loan loss provisions more as to convince their bondholders. Instead, another variable, 'the total borrowed funds', is employed in this paper to present the extent to which a bank leans upon external debts to finance. This paper addresses that banks with relatively more borrowed funds are supposed to signal more in order to prevent being mispriced by their stakeholders.

On that point, the hypothesis is stated that:

H2: *Discretionary loan loss provisions are positively related to the level of external debts*.

5. Research Design

In general, the common approaches to investigate accounting accruals could be: (1) to proceed on a specific accrual account that affects earnings and incomes in a measurable way; (2) to exercise an analytical accrual model, e.g., the Modified Jones Model (Dechow et al, 1995), which basically forms an equation of total accruals; (3) to develop a benchmark/frontier as to see the variations that to what extent the manipulated accounts are differed from the majority, e.g., Anandarajan et al.(2005). And specifically, the research part in the next will follow the second approach.

5.1 Empirical model

This part adopts the one-stage model proposed by Lobo and Yang (2001). Consistent with previous research, the model assigns proxies separately for the non-discretionary component and the nondiscretionary component of the total loan loss provision. As seen in the linear equation, the loan losses provision is the dependent variable and the group of independent variables is set in two brackets, i.e., one for the nondiscretionary component and the other for the discretionary component; to be exact, the variables in the first bracket are used to control the proportional part of loan loss provisions so that the unpredicted part is left to the variables in the second bracket to estimate. Except the primary capital ratio (CAP), all the variables are deflated by total equity.

$$LLP_t = \alpha + (\beta_1 \Delta L_t + \beta_2 LLR_{t-1} + \beta_3 CO_t + \beta_4 IL_{t-1} + \beta_5 \Delta IL_t) + (\beta_6 CAP_t + \beta_7 EBTP_t + \beta_8 \Delta EBTP_{t+1} + \beta_9 BF_t) + \varepsilon_t$$

LLP_t = loan loss provisions totaled in the current period;

ΔL_t = change in total loans from the previous period to the current period;

LLR_{t-1} = the beginning loan loss reserves in the current period, i.e., the end reserves in period t-1;

CO_t = net charge-offs (i.e., the total charge-offs minus write-backs);

IL_{t-1} = the beginning balance of impaired loans, i.e., the balance in previous period end;

ΔIL_t = change in impaired loans;

CAP_t = Tier I capital ratio;

$EBTP_t$ = earnings before taxes and provisions in the current period;

$\Delta EBTP_{t+1}$[14] = changes in one-year-ahead earnings before taxes and loan loss provisions (β_8 – the coefficient for H1);

BF_t = total borrowed funds (β_9 – the coefficient for H2);

ε_t = error term;

Dependent variable

On the left side of the equation, LLP represents the provision account prepared for potential loan losses, which is exhibited in the income statement and records as an expense. As a prepaid accrual, managers have to adjust its concrete amount on certain purposes in each period whilst this kind of adjustment is rarely observed on cash flows. The basic idea of the linear model above is to explain the changes of loan loss provisions in terms of certain purposes, i.e., earning management, capital management, and signaling effect, of which the third purpose will be particularly examined in this paper.

Control variables

As to the right side, net loans, loan loss reserves, net charge-offs, and impaired loans appear to affect loan loss provisions in a considerable part and each account is closely related to each other; thus the five variables - ΔL_t, LLR_{t-1}, CO_t, IL_{t-1} and ΔIL_t are employed in the model to control the non-discretionary part of loan loss provisions.

Furthermore, their relevant coefficients, β_1, and β_3 till β_5, should be positive; that is to say, the increase of loan loss provisions is likely to be observed after any of the aggregate loans, the impaired loans, or the uncollectable debts rise. However, β_2 is expected to be negative because the loan loss reserve prepared in previous periods has the similar effect as loan loss provisions

[14] This abbreviation in some tables is seen as ‘ΔEBTPe’, in which ‘e’ stands for ‘expected’.

and the approximate sum of these two accounts are usually maintained to a certain level: when one is prepared more in advance the other will be made less lately.

Core variables

CAP_t stands for the proportion of primary capitals in total risk-weighted assets at banks. It measures the extent to which the core capital of banks is trustworthy and one common regulation towards this account is introduced by the Basel Accord of 1988. Since the rules used by banks to define capitals have been standardized across countries, bank managers are not likely to manipulate capitals in a direct way when banks have difficulties to maintain some require capital ratios; instead, they turn to manipulate accruals as to expect the sequent changes can indirectly alter the level of capitals, which in total is terms as 'capital management'. Considering the capital guidelines set by certain committees, in a banking entity which has few worries about storing the regulatory capitals, there will be no need for the managers to adjust loan loss provisions in response; so as to the CAP coefficient, β_6 is expected to be negative.

EBTP, earnings before tax and provisions, is one of the most crucial numbers that stakeholders are eager to read in bank reports. Because the calculation of earnings is complicate and involves many items, any movement in the calculating process could result in another appearance of reported earnings in the end and the movement is specified on loan loss provisions in this paper. On the behalf of banks, managers sometimes manipulate loan loss provision in order to produce a higher or a stable number of earnings, since otherwise the relatively low or fluctuating earnings would discourage stakeholders to believe in the banks - it is exactly the fact on which 'earnings management' is based.

In addition, because the impact of manipulating accruals on earnings could be either plus or minus, it all depends on what kind of earnings is expected in the end, e.g. for higher earnings, managers will arrange fewer loan loss provisions so that less expenses are deducted from the pre-provision earnings. That is to say, the relation between the level of loan loss provisions

and the pre-provision earnings in the current period, $EBTP_t$, remain uncertain unless more specific situation is provided; therefore the sign of the coefficient β_7 is undefined.

Not only the present earnings but also the perspective earnings concern stakeholders. In particular, the trend of future earnings is presented by the change in earnings from the current period to the next period, termed as $\Delta EBTP_{t+1}$. But the problem arises that relatively speaking, only managers has enough access to the trend information while stakeholders do not. In order to signal the strength of banks, e.g. better earnings in the next period, bank mangers are supposed to engage in signaling activities as to broadcast. As discussed in Chapter 4, the first hypothesis states that the movement in loan loss provisions made by managers should be in the same direction as the tendency of earnings so that the coefficient β_8 should be positive.

BF_t captures the total borrowed funds in banking entities, which is booked in the liability side of balance sheet and includes these sub-accounts: short-term borrowings (including commercial papers), senior debt, long-term debts, and capital securities. This variable implies how banks maintain their liquidity with external funds and thus managers need to dress up these funds in order to comfort stakeholders, which is the other signaling effect examined in this paper. Suppose a bank recently borrows a lot from external creditors, a sudden upturn is expected afterwards and will be seen in annual report. In consequence, managers will need to arrange more loan loss provisions to neutralize the sudden upturn, which meanwhile send the signal to stakeholders that the bank is now in a better-financed situation. Then, the positive relation between the borrowed funds and loan loss provisions is built up and β_9 is predicted to be positive.

Deflator

Specifically, a common deflator (denominator) is needed to scale all the variables except CAP into compatible ratios. In the first place the variable ‘the market value of equity’ is considered to deflate variables. But after collect the data from the sample banks the original plan has to be altered: due to the ongoing credit crisis, quite a large portion of banking entities chose to

voluntarily delist from the stock exchange market in order to release the burden of compliance costs (Marosi & Massoud, 2005, p.24) and to resume greater financial flexibility. In consequence, there exists neither 'market price' for those banks nor market value of their equities available to quote in this study. Although such an industrial shift only happened to a group of banks, which means to the rest 'market value of equity' is still an achievable variable to compute, it is decided to employ 'equity' as the denominator instead of 'market value of equity' to balance the sample entities.

5.2 Analyzing approach

This section will introduce the quantitative approaches used to analyze data in later chapters: descriptive statistics of variables, correlation analysis, and mainly the pooled regression.

Particularly, Chapter 6 describes the process how the data are selected from the two sample groups: bank holding companies and commercial banks, and then presents the features of the two groups with a series of accounting ratios. In Chapter 7, the variables are deflated by the equity at first. The purpose of making descriptive statistics is to see whether the two sample groups are comparable in terms of the variable set and in which aspects they are differed from each other. Secondly, a bivariate correlation analysis is taken among the variables.

At last, all the data are formed into series of panel data, i.e. of both time-series and cross-section properties, so that the pooled regression analysis can be conducted and each of the two bank groups is tested as an entire sample in the pooled regression. In that way it requires the 'estimation of only a signal parameter for each motivation' (Lobo &Yang, 2001, p.231); that is, each coefficient generated from the regression represents either bank holding companies or commercial banks, which implies that the comparison between groups will be fairly doable than if in bank-specific regressions. Besides, the pooled regression will be taken once again with all the same data sets except that the data from the two years of 2007 and 2008 are excluded this time as to eliminate the impact of credit crunch on the management of loan loss provisions, if any.

6. Sample Formulation

6.1 Sample selection

In brief, the sample of this paper is about a pair of bank groups: bank holding companies (BHCs) and commercials banks (CBs) and the research period are considered from 1997 up to 2008. Particularly, the database of BankScope (Bureau van Dijk) is used as the major data source, in which the business information and the annual reports of 13,630 US banks over 16 years (2008 as the last available year) can be inquired.

Bank holding companies (BHCs) are chosen as an example group of the emerging banks and banking entities which are grant with some industrial treatments that traditional banks do not have, e.g. more financial and regulatory flexibility. In parallel, another group of banks is selected, commercial banks (CBs), as to represent traditional and 'typical' banks. Just on the contrary of BHCs, CBs have lots of regulations and guidelines to adhere to since deposits and loans make up of its largest part. Then, thinking of their respective background, the type of BHC is created as a released form of banks, which is therefore adopted by the banks with less adequate funds or/and smaller board of shareholders. On the other hand, CBs emerged after the Great Depression and are restricted on banking activities for better soundness. Now these two groups of banks are mostly engaged in the retail banking sector of the U.S. market so that the sample of this study is supposed to tell stories about that sector thereafter.

The collection procedure begins with 126 active BHCs and 181 active CBs, which are respectively gathered from the top 200 list of each bank group (sorted by descending total assets); then 37 BHCs and 48 CBs are left with 'institution-consolidated statements'[15]. Concerning the data availability of variables defined in previous section, 25 BHCs and 21 CBs comprise the sample. And, except CIT Group, Inc.[16], all the selected CBs are exhibited

[15] In reality, when referring to a particular bank or banking entity, it can have several subsidiaries next to its headquarters. Here in this paper only the consolidated annual reports will be used, in which the accounts from subsidiaries are combined into the accounts for headquarters.

[16] It is the first bank on the list of top 200 CBs, which can be read in Appendix.

‘delist’, which is reasonable concerning the unfavorable market at this stage. In total, the sample filtering steps described above result in 2,433 observations in the BHC pool and 1,964 observations in the CB pool.

6.2 Sample features

Table 1 present three categories of accounting ratios, i.e. about asset quality, capital and operations, to reveal the main features of the banks.

- Table 1. Sample features -

The ratio of loan loss reserves to impaired loans (LLR/IL) in BHCs is 105.99 on average and 95.67 in CBs, which implies that the BHC group does a better job than the CB group in hedging losses but might be criticized for less accurate estimation of losses. The mean of the impaired loan to equity ratio (IL/E) in BHCs is 162.88 and 23.57 in CBs, while the medians of this ratio in both groups are quite close, 16.24 in BHCs and 19.57 in CBs, which means that either there are much more extreme values of impaired loans in BHCs than in CBs or the total of impaired loans in BHCs is much larger than that in CBs. Despite of either reason, it is confirmed that the issue of impaired loans as part of equities is relatively more obvious in BHCs.

Because of the uniformed guidelines, the Tier1 ratios in the two groups are almost the same in terms of means, medians, and standard deviations. As to the capital fund[17] to loan ratio, the two groups have similar means and medians; yet, the standard deviation is 8.02 in BHCs and 1.47 in CBs, which may be explained by that BHCs act more active in investing long-lived assets than CBs do; in other words, large investment costs could be more frequently seen in BHCs. In addition, a similar situation of statistics is seen with the capital fund to short-term debts ratio as well.

[17] ‘Capital fund’ is defined as the bundle of funds on acquisition of lands, buildings and machinery.

In brief, the two bank groups appear quite alike in terms of most ratios while the explicit differences between them arise on the impaired loan to equity ratio, the return on equity and the dividend payout ratio, which are all found with large means and standard deviations in BHCs. That is to say, BHCs are relatively more desired to shareholders if the shareholders could be rather indifferent to the large impaired loans and the great volatility of the BHC group.

7. Results

The chapter is going to present the descriptive statistics of variables, the correlation analysis, and the results of the two linear regressions: one with the complete sample period and the other with the period excluding the crisis years. By comparing the statistics and results respectively generated with each sample group, the main content is aimed to see whether the facts in U.S. banking sector vary between groups and to what extent the variation exists.

In line with Section 3.4, the explanatory variables, particularly the two hypothesis-related variables will be emphasized. If any significant results are found with the other two variables, additional concerns would be added as well. In the end of this chapter I will make some empirical comparisons between this paper and prior papers and discuss several limitations.

7.1 Descriptive statistics

The detailed statistics about variables are given in Table 2: the raw data (in million US$) are listed in Panel A and Panel B exhibits the scaled data.

- Table 2. Descriptive statistics -

In Panel A, the average amount of loan loss provisions (LLP) in the group of BHCs is 843.546 and 70.514 in CBs; the standard deviation is respectively 2819.486 in BHCs and 246.278 in CBs – in terms of the two statistics, the LLP of the BHC group is averagely as ten times as much as that of the CB group while the deviation of this data set in BHCs is also ten times greater than that in CBs.

Then turn to the changes in one-year-ahead earnings (ΔEBTPe): the ΔEBTPe on average is -177.175 with the standard deviation of 3159.153 in BHCs and in CBs it is 5.573 on average with the standard deviation of 671.537. The difference of highest ΔEBTPe and lowest ΔEBTPe is 53,151 in BHCs and 12,376 in CBs. As to the total borrowed fund (BF), with the BHC sample the mean of BF is 49,843 and the standard deviation is 142,644; with CB sample the mean is 6,514 and the standard deviation is 12,991.

Briefly, the BHC sample group is described with much larger average values in terms of the raw data about LLP, ΔEBTPe, and BF that the CB group in Panel A. Larger deviations are also indicated in BHCs, which means that the selected BHCs tend to be disparate to a great extent. Consequently, the account numbers are supposed to be more fluctuating in BHCs compared with CBs and the managerial practices in each specific BHC would be helpful to explain the relatively severe fluctuations.

Furthermore, all the raw data except Tier1 capital ratios (CAP) are scaled to ratios by the denominator of the total equity (E) in Panel B. The average of the ratio LLP/E is 0.045 in BHCs and 0.050 in CBs, with the standard deviation is respectively 0.0709 and 0.0938. The third quartiles of the two groups are almost the same, 0.055 in BHCs and 0.057 in CBs. So according to the three pairs of statistics, the scaled data collected from each sample group are fairly comparable for the dependent variable.

The ratio ΔEBTPe/E is the variable related to the first hypothesis. Its mean in BHCs is 0.018 and 0.017 in CBs, while its standard deviation is 0.609 in BHCs and 0.208 in CBs. Bedsides, the variable median is -0.006 with the BHC sample and 0.022 with the CB sample. Hence, it could be inferred that the changes in one-year-ahead earnings are rather irregular in BHCs and more acute movements on the earnings account are observed there. Then the ratio BF/E is used as the variable for the second hypothesis. The variable mean is 3.496 in BHCs and 3.839 in CBs, so the two sample groups are similar in terms of their average borrowings. Also, the standard deviation about this variable is 23.052 in BHCs and 4.494 in CBs, which once again implies the volatility of the banking activities in BHCs, not only in earnings but in borrowed funds as well.

After all, the disparity in Panel A becomes moderate between the two groups in Panel B. In terms of the raw data, the BHC group is portrayed as a much larger player than the CB group in banking sectors, which may be explained by the greater flexibility that BHCs have in banking activities - that is, BHCs have the capacity to attract more kinds of clients and funds. Yet in terms of the scaled ratios, i.e. the variables, the two sample groups turn to be comparable to much extent. Not surprisingly, the wide differences between them in Panel A

are caused by the data in absolute values; after they are scaled into ratios, the data in relative values mitigate the variation between banks and thus make the group-comparison applicable in next sections.

7.2 Correlation analysis

The primary concern of the correlation analysis is on whether there is any (significant) correlation between each pair of variables – firstly between the dependent variable and each independent variable, and then between each pair of independent variables. The analysis uses two-tailed tests and the results about correlations 'r' and significances 'sig.' are presented in Table 3.

- Table 3. Correlations -

In both sample groups the control variables, ΔL/E, LLR/E, CO/E, IL/E and ΔIL/E, are all found significantly related to the dependent variable LLP/E. And, only the ΔL/E is negatively correlated to the LLP/E and the others are positive, whose signs are as the same as expected in Section 5.1. The variable ΔEBTPe/E is not significantly correlated to the dependent variable LLP/E in BHCs, r (sig.) =-0.029 (0.68) and so does the variable BF/E, r (sig.) =0.052 (0.426). Likewise, neither of the two explanatory variables is tested significant related to the dependent variable in CBs, r (sig.) = 0.087 (0.241) for the variable ΔEBTPe/E; -0.033 (0.642) for the variable BF/E.

The variable CAP in BHCs is significantly related to all the control variables with 0.01 significance level, while of all the control variables the CAP in CBs is significantly related to the LLR/E only. It implies that BHCs tend to behave in a conservative manner and adhere to the required capital level by adjusting provisions in line with their loans and loan relatives; CBs have the routine to prepare reserves to approach the required capital level, in which situation adjusting loan loss provisions may be conducted therefore but for no else purposes.

The linearity between the two core variables and the set of control variables are quite different with each sample group. In BHCs the ΔEBTPe/E is significantly related to both the variable

ΔL/E, r (sig.) =0.200(0.004) and the variable ΔIL/E, r (sig.) =0.644(0); the BF/E is significantly related to all the control variables except the variable CO/E. In CBs the ΔEBTPe/E is not significantly related to any control variable; the BF/E is significantly related to the ΔL/E, r (sig.) =0.313 (0) with 0.01 significance level, and to the LLR/E, r (sig.) = -0.158 (0.031), with 0.05 significance level.

According to the correlation analysis about both sample groups, the control variables, i.e., the non-discretionary variables are found significantly related to the dependent variable but the two hypothesis-related variables. Therefore, a couple of defects need to be noticed. Firstly, not a few of significant relations are indicated in Table 3 between the discretionary variables (particularly, the CAP and the BF/E) and the non-discretionary variables, which may impair the base of this paper that only the discretionary provisions are thought relevant to managers' signaling activities and that is the reason to decompose the total loan loss provisions into two components in the beginning. Secondly, in order to choose explanatory variables for a linear model, the connections between the explanatory variables should be as tiny as possible – particularly related to this paper, it suggests the correlation between ΔEBTPe/E and BF/E should be insignificant. In Table 3 the correlation between these two variables is significant in BHCs, r (sig.) = -0.775 (0) but insignificant in CBs, r (sig.) = -0.053 (0.474).

7.3 Pooled regression I

The regression results are given in Table 4 in all details. The sign of each independent variable as the same as predicted in Section 5.1 and these predicted signs will be compared with the signs of coefficients produced in linear regressions. At first, the pooled regression is conducted with the complete sample period, from 1997 to 2008.

- Table 4. Panel A&B -

In the BHC sample groups the coefficients of all control variables are found with the predicted signs, except ΔL/E and LLR/E and so do for CBs except LLR/E and IL/E. The coefficients of all the core variables are negative for BHCs, on the opposite of the predicated

signs provided in previous content. As to the CB group, the coefficients of the EBTP and the ΔEBTPe/E are positive, but of the CAP and the BF/E the coefficients are both negative.

The regression strength is considered sufficient in terms of the adjusted R^2, i.e., 0.865 for BHCs and 0.794 for CBs; that is to say, about ten percent of variations about the dependent variable can not be explained by the set of independent variables. However, due to the facts that (1) the high correlation between the independent variables mentioned in Section 7.2 and (2) although the adjusted R^2 is high, only the control variables tend to be significantly related to the dependent variable, the possibility of (multi-)collinearity is suspected so the collinearity diagnostics is taken in the next.

In terms of tolerance value and variance inflation factor (VIF) – simply a pair of reciprocals of each other – and the detecting criterion proposed by Klein and Nakamura (1962), 'if VIF is greater than $1/(1- R^2)$ or a tolerance value is less than $(1- R^2)$, multi-collinearity can be considered as statistically significant.' Here in the BHC sample, $R^2 = 0.865$, the averaged tolerance value = 0.492, the criterion related to tolerance value[18]= 0.135<0.492; in the CB sample, R^2 =0.794, the averaged tolerance value =0.729, the criterion related to tolerance value[19]= 0.206<0.729. Thus, the collinearity is not found for either BHCs or CBs.

Then turn to the eigenvalue and the condition index to see whether any extreme statistics could be identified. In the group of BHCs the minimum eignevalue (0.033) and the maximum condition index (11.651) come out in the tenth dimension, i.e. when all the predicators (the nine independent variables plus a constant term) are included, and neither of the two statistics is excessive, so that the entire regression for BHCs is viewed collinearity-free. For CBs, the tenth eigenvalue is not close to zero (0.087) and the tenth condition index (6.708) is far from 10, which proves the regression with CB samples are free from collinearity as well.

Yet in the lattice of the variance proportions, certain values are relatively outstanding, i.e. around 0.7-0.9. As advised in Belsley et al. (2004), any independent variable with outstanding variance proportions could be removed from the regression in order to achieve a better result.

[18] Calculated as: 1- R^2 =1-0.865=0.135, in which R^2 = 0.865.
[19] Calculated as: 1- R^2 =1-0.794=0.206, in which R^2 = 0.794.

In particular, after comparing the two lattices, the variable ΔEBTPe/E appears to be such an example: one of its variance proportions is around 0.70 in both sample groups, which suggests that this variable may undermine the regression by large proportion in a certain dimension.

Not over yet, since this regression contains the data with the time-series property, there might be the problem of autocorrelation so that the Durbin-Watson test is taken in order to eliminate that 'threat'. For BHCs, its value =1.879, the number of particular samples n=25, the number of predictors k=9, d_L=0.473, d_U=2.209[20], the value of 1.879 falls into the range, no autocorrelation exists, so it is safe to apply the OLS regression with the BHC sample. Likewise, n=21, k=9, d_L=0.331, d_U=2.434, the Durbin-Watson value =1.497, so again, no need to worry about any autocorrelation for CBs, too.

Seen in the ANOVA table, the p-value (seen as 'sig.' or 'prob.' in tables) of F-statistics is around 0 for both groups, which in overall confirms the significance of the whole regression model. And then, the two core variables will be discussed in consistence with each of the two hypotheses:

H1: Firstly for BHCs, the coefficient of the variable $\Delta EBTP_{t+1}/E$, β_8 is negative. In terms of the t-statistics and the p-value (prob.), the first hypothesis is rejected, i.e. the t-statistics (prob.) of β_8 =-3.396 (0.001). Then for CBs, the β_8 is positive as predicated and the t-statistics (prob.) =4.953(0), so that the first hypothesis is approved this time.

H2: The coefficient of the variable BF/E, β_9 is negative for BHCs and the t-statistics (prob.) of β_9 =-4.399 (0). The second hypothesis should be rejected because the sign is as the same as predicted. For CBs, the sign of β_9 is negative as well. The t-statistics (prob.) of β_9 =-0.281 (0.7788) so that the second hypothesis is rejected.

7.4 Pooled regression II

This section presents the second linear regression: the two years of 2007 and 2008 are

[20] The number is retrieved from the tables of Durbin-Watson statistics as given, particularly used for the linear model with an intercept (i.e., the constant term, α) and with the significance level of 0.01.

excluded from the original sample period as to see whether the current crisis affects the management of loan loss provisions for signaling purposes. Also, the detailed results can be read in Table 4, together with the results of the previous regression.

- Table 4. Panel C&D -

For BHCs, the coefficients of all the control variables are positive and the signs of all the coefficients are as the same as predicted except the LLR/E. As to the discretionary variables, the coefficients of the CAP, the ΔEBTPe/E, and the BF/E are all negative in this sample group. For CBs, only the coefficients of the LLR/E and the IL/E does not have the predict signs in the set of control variables. The coefficients of the CAP and the BF/E are negative, but positive of the EBTP and the ΔEBTPe/E.

The adjusted R^2 in the sample group of BHCs is 0.841 and 0.759 in CBs, which means that the regression model is acceptably explainable but may be impaired by the problem collinearity because of few explanatory variables with significant coefficients. As to do the collinearity test, $R^2 = 0.841$ in BHCs, the averaged tolerance value = 0.756, the criterion related to tolerance value[21]= 0.159<0.588; in the CB sample, R^2 =0.759, the averaged tolerance value =0.756, the criterion related to tolerance value[22]= 0.206<0.756. As a conclusion, there is no collinearity exist in either sample group.

For BHCs, the eigenvalue in the tenth dimension is 0.043 and the condition index is 10.981, neither of which sounds the alarm for collinearity. Also, there is only one value larger than 0.70 in the variation-proportion lattice; in other words, barely no extreme statistics can be found in the collinearity diagnostics. Then for CBs, the situation is quite similar because in the tenth dimension the eigenvalue is 0.081 and the condition index is 6.828, plus that few outstanding values in the lattice.

Concerning the possible autocorrelation problem, the Durbin-Watson value in BHCs is 1.674 and 1.464 in CBs, both of which are in the desired range[23] so that no autocorrelation for

[21] Calculated as: 1- R^2 =1-0.759=0.241, in which R^2 = 0.759.

[22] Calculated as: 1- R^2 =1-0.794=0.206, in which R^2 = 0.794.

[23] Since the n and the k do not change in the two regressions, the desired range is as the same as used

either sample group. In addition, the p-value (seen as 'sig.') of the entire regression is 0 for both sample groups. At last, the two hypotheses are discussed related to the pair of core variables, $\Delta EBTP_{t+1}/E$ (β_8) and BF/E (β_9).

H1: The β_8 in the sample of BHCs is negative and its t-statistics (prob.) is -1.052 (0.295), so the first hypothesis is rejected for BHCs. Then for CBs, the β_8 is positive as predicted but its t-statistics (prob.) is 0.884 (0.379), so the first hypothesis is rejected for CBs as well.

H2: The β_9 is negative for BHCs and its t-statistics (prob.) is -2.858 (0.005), which together reject the second hypothesis because the sign is not as the same as predicted and the correlation is insignificant. For CBs, the sign of β_9 is negative as well and the t-statistics (prob.) is -0.878 (0.381), so the second hypothesis is rejected for CBs, too.

7.5 Comparison with prior research

Next I will this paper with prior studies in terms of sample size (observations), research period, adjusted R^2 of the entire model, and the statistics of similar variables (if any), so that the scope and magnitude of this study can be provided in a comparative manner.

First of all, the number of observation is rather disparate in each study. In this paper I prepare a qualified sample though not a splendid data pool still – in total around 50 banking entities, 500 bank-year observations for each variable – that is most like the sample size of Anadarajan et al. (2007), 50 Australian commercial banks and 441 bank-year observations.

Then, the research period simply depends on the interests of the authors. Usually it is seen that the research papers are based on the present tense when the authors live and approximate one decade appears to be a popular solution to gather time-series data, which is exactly the case of this paper. Annual data are more frequently used in prior papers because easier to manage and in total a longer time horizon can be investigated, however which might not be agreed on by some studies which also focus on signaling effect. In particular, Hatfield and Lancaster (2000) choose to examine the signaling effect in a more specified period, i.e. the

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in the previous regression, i.e. [0.473, 2.209] for BHCs and [0.331, 2.434] for CBs.

announcement day, and define the research period into intervals, which could be another way in doing this category of studies.

In terms of the adjusted R^2, the model strength in this study is rather noteworthy than that of prior papers: e.g. the adjusted R^2 of the pooled regression in Agusman (2008) is 0.31, much smaller than the adjusted R^2 of the model used in this paper. Yet as discussed above, a high R^2 does not promise a worriless regression because it may be driven by some overlapped explanatory variables: although the regression as a whole is highly valid, no or few coefficients of the independent variables are significant – as to this paper, although the problem of collinearity is proven nonexistent here, the high adjusted R^2 is seemingly generated by the non-discretionary variables.

Probably owing to that the management of accruals have been examined a lot so far, the explanatory variables used in prior papers are very similar, particularly the proxies for non-discretionary accruals and this circumstance is even more explicit when the dependent variable is loan loss provision (also, loan loss reserves or loan loss allowance). Here I compare the two hypothesis-related variables with some analogous variables employed by prior researchers.

H1: Ahmed et al. (1999), Lobo and Yang (2001), and Anadarajan et al. (2007) use the variable 'the change in one-year-ahead earnings before tax and provisions' to measure the future profitability of banks, which is one of the aspects that managers intend to signal and thus hypothesized in this paper. Of those papers, Lobo and Yang (2001) employs the pooled regression as well as this paper does and their results turn that for this earnings-ahead variable, the t-statistics (prob.) = 0.446 (0.6559), which means the related hypothesis should be rejected and probably caused by the use of pooled regression[24].

H2: Kanagaretnam et al. (2004) use the ratio of loans to deposits (L/DEP) to represent the level of external funding that a bank need, as this paper uses the ratio of borrowed funds to

[24] In fact Lobo and Yang (2001) also make two other kinds of regression for comparison, bank-specific regression and fixed-effect regression, respectively in which the p-value of the $\Delta EBTP_{t+1}$ coefficient is 0.003 and 0.2283, both better than the result generated in the pooled regression.

equity (BF/E). The authors predict that the coefficient of the variable L/DEP is positive for 'banks with a high pre-managed relative performance' but negative for low-performance banks (p.135). The correlation is confirmed in regressions but the value of the relevant coefficient itself is quite small, around 0.001 only, which implies that this kind of linear relation may not be explicitly observed in reality.

7.6 Limitations

In the very beginning this paper is based on one fact: accruals are relatively vulnerable to discretions and therefore could be managed to signal bank-inside information. Once bank mangers and bank stakeholders realize the signaling effect, an invisible information channel is settled between the two sides. However there is another fact that the accruals may be manipulated to cover the real situation about banks. Dechow et al.(1996) state that 'to the extent that management uses their discretion to opportunistically manipulate accruals, earnings will become a less reliable measure of firm performance and cash flows could be preferable' (p.5). As a result, it may be misleading to suppose the loan loss provisions to be the tool of managers' signaling activities.

Secondly, the use of pooled regression may be blamed for that it in effect 'blurs' the borders between each particular bank in the sample pool. Instead, the bank-specific features should be taken into account in the study of signaling effect by doing bank-specific regressions in addition. Lobo and Yang (2001) mention that the signaling behaviors are born an individual, differential feature to each banking entity 'due to the different situations they face.' (p.236)

Thirdly, the use of the account, the total borrowed funds, may count one of the reasons why the second hypothesis is rejected. By definition, this account is comprised of the debts financed with both bonds and equities, which are relatively too general for this paper to specify its relevant stakeholders and to measure the signaling effect. Hence, although it is rationale to hypothesize the relation between loan loss provisions and external debts, the hypothesis could be rejected unless the signals and the signal receivers are properly classified.

Fourthly, I make the pooled regression twice in previous sections, in which the second regression is aimed to test whether the current recessions affect the facts of signaling effect. Nevertheless, the results of the pooled regression II reveal little differences from the results of the pooled regression I and the two hypotheses are rejected in the second regression, no matter for which sample group. A possible reason could be that at present it is still a bit early to discuss the effect of the current crisis on this research topic. In order to deliver some reliable results concerning the crisis, it is suggested to compare the before-crisis period and the post-crisis period in a balanced manner. But so far, there are only two single years that can be employed as the post-crisis observations; even when the two years are excluded from the sample period, it may not help generating distinctive results.

8. Conclusion

This paper studies on the signaling effect in a pair of sample groups, bank holding companies and commercial banks, in the U.S. banking sector. It is primarily assumed that bank managers possess more and better information than stakeholders so that the device to signal the information is needed by managers on behalf of banks: the changes in accrual accounts exhibited in annual reports are therefore read as the 'signals'.

The study here employs loan loss provisions as the particular accrual and decomposes the total provisions into the two components. A set of explanatory factors is proposed to estimate the discretionary component and the factors 'the changes in one-year-ahead earnings before tax and provisions' and 'the borrowed funds' are respectively related to the two hypotheses. As to test the hypothesized relations, I formulate the linear equation with a constant term, five non-discretionary factors (as control variables), four discretionary factors (including the two hypothesis-related variables) and an error term. After that, I use the pooled regression twice to analyze the data of the two sample groups, once in the complete sample period from 1997 to 2008 and the other in the no-crisis period of 1997-2006.

The regression results indicate that (1) the level of loan loss provisions is positively related to the change in one-year-ahead earnings only at commercial banks in the period of 1997-2008; (2) there exists no significant relation between loan loss provisions and the total borrowed funds in either bank group; (3) overall the linear model is tested valid with great proportion of estimates and no existence of either autocorrelation or collinearity.

Compared with prior papers, the positive relation between loan loss provisions and the change of next-period earnings are also confirmed in Lobo and Yang (2001), while Ahmed et al. (1999) and Anadarajan et al. (2007) states that the relation is negative. As to the relation between loan loss provisions and the borrowed funds, none of previous authors ever examine on similar relations, except that Kanagaretnam et al. (2004) suggest the level of loan loss provisions are positively related to the need for external funds.

On the basis of available evidence, the regression analyses of this paper should be considered acceptable and contribute the signaling-effect literatures in the followings: the signaling effect of managing loan loss provisions to 'announce' future earnings is not explicit any more; bank managers do not adjust loan loss provision in order to signal the situation about their external debts; the two bank groups are not distinct from each other in managing loan loss provisions for signaling purposes; the current crisis do not make any remarkable impact on the management of loan loss provision for signaling purposes, or at least not yet so far.

In the end, there are several research directions which can be followed in further papers: (1) instead of sorting banks by types, to classify banks with different asset sizes or some other features; (2) probably better to discuss the impact of crisis on the accrual management a couple of years later; (3) to examine the signaling effect in bank-specific regressions; (4) to seek for other latent factors/aspects that managers intend to signal via the manipulation of accruals.

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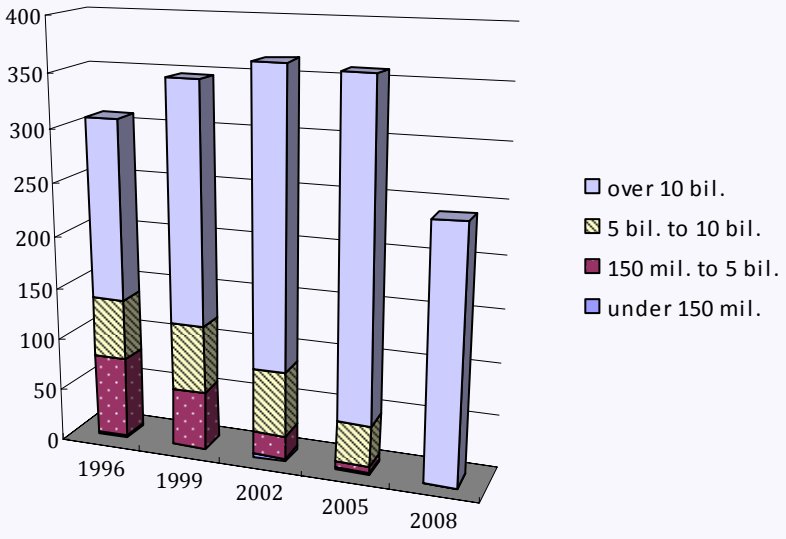
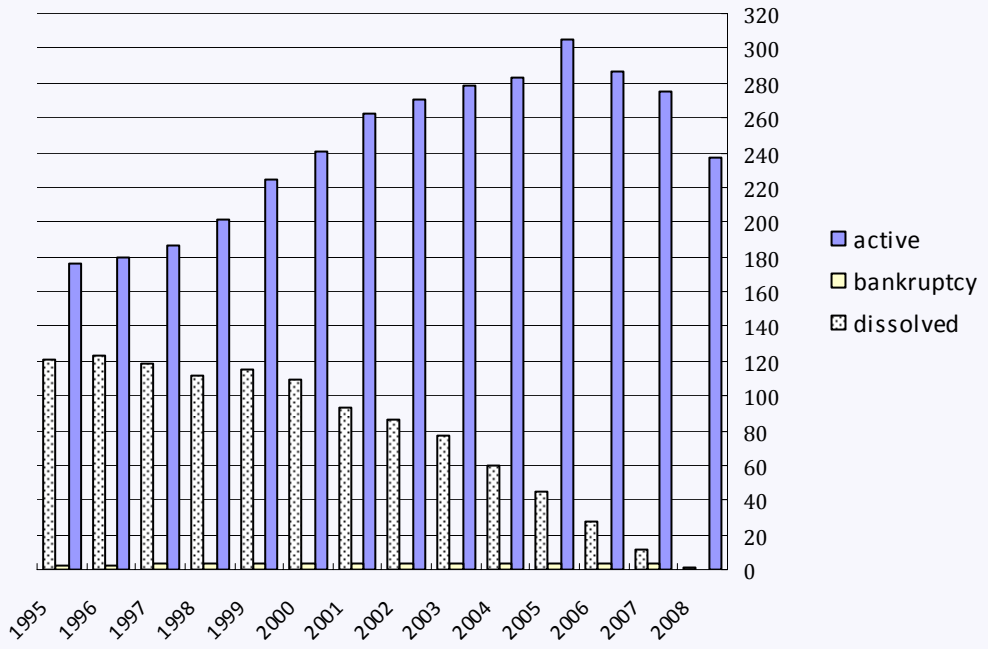
Figures & Tables

Figure 1. Shares of Banks by Total Assets in Five Years



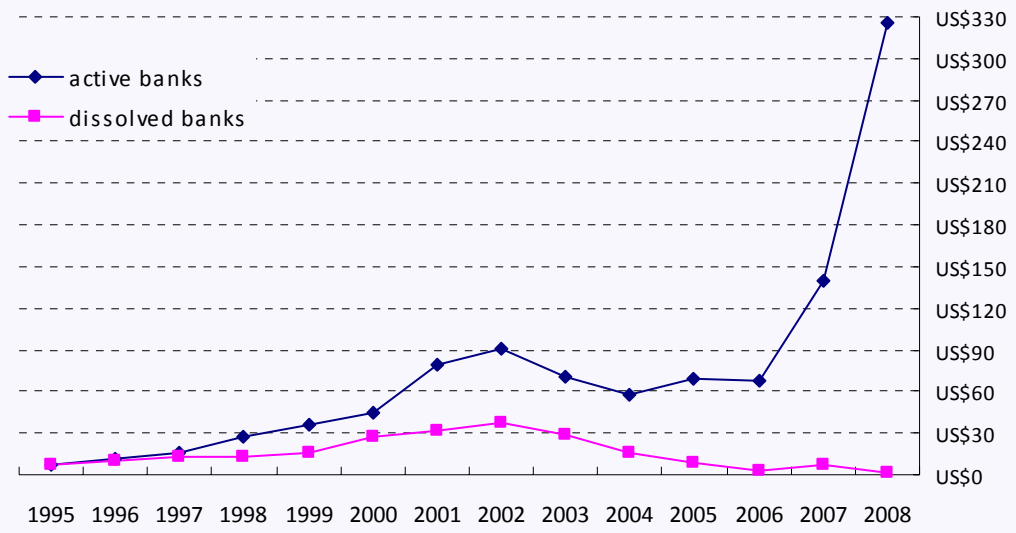
Data source: BankScope (BvD) database, last updated in June, 2009.

Figure 2. Distribution of banks by status during 1995-2008



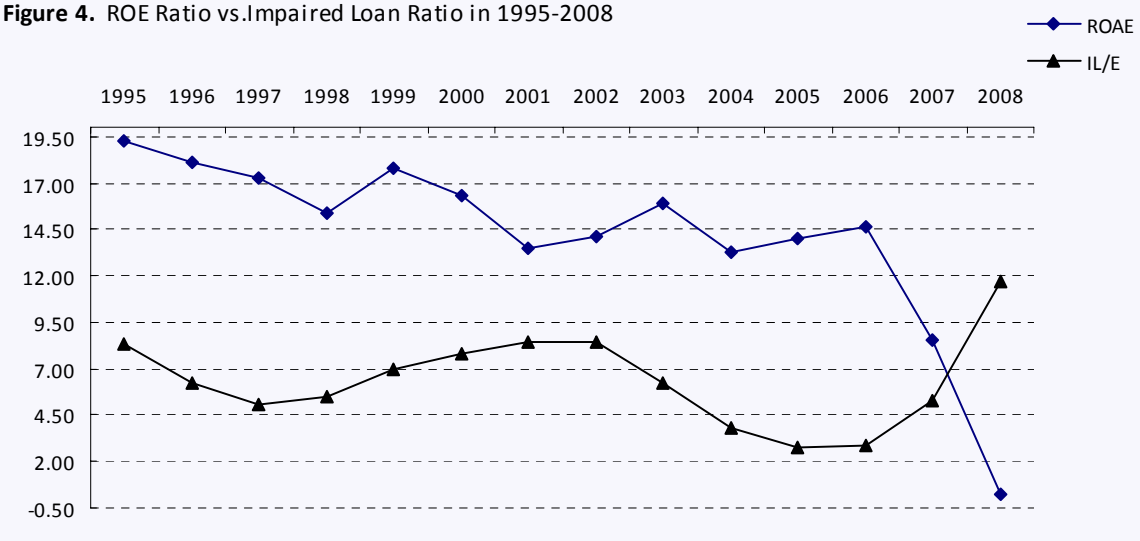
Data source: BankScope (BvD) database, last updated in June, 2009.

Figure 3. Changes of Loan Loss Provisions in 1993-2008 (US$ million)



Data source: BankScope (BvD) database, last updated in June, 2009.

Figure 4. ROE Ratio vs.Impaired Loan Ratio in 1995-2008



Data source: BankScope (BvD) database, last updated in June, 2009.

Figure 5 Framework

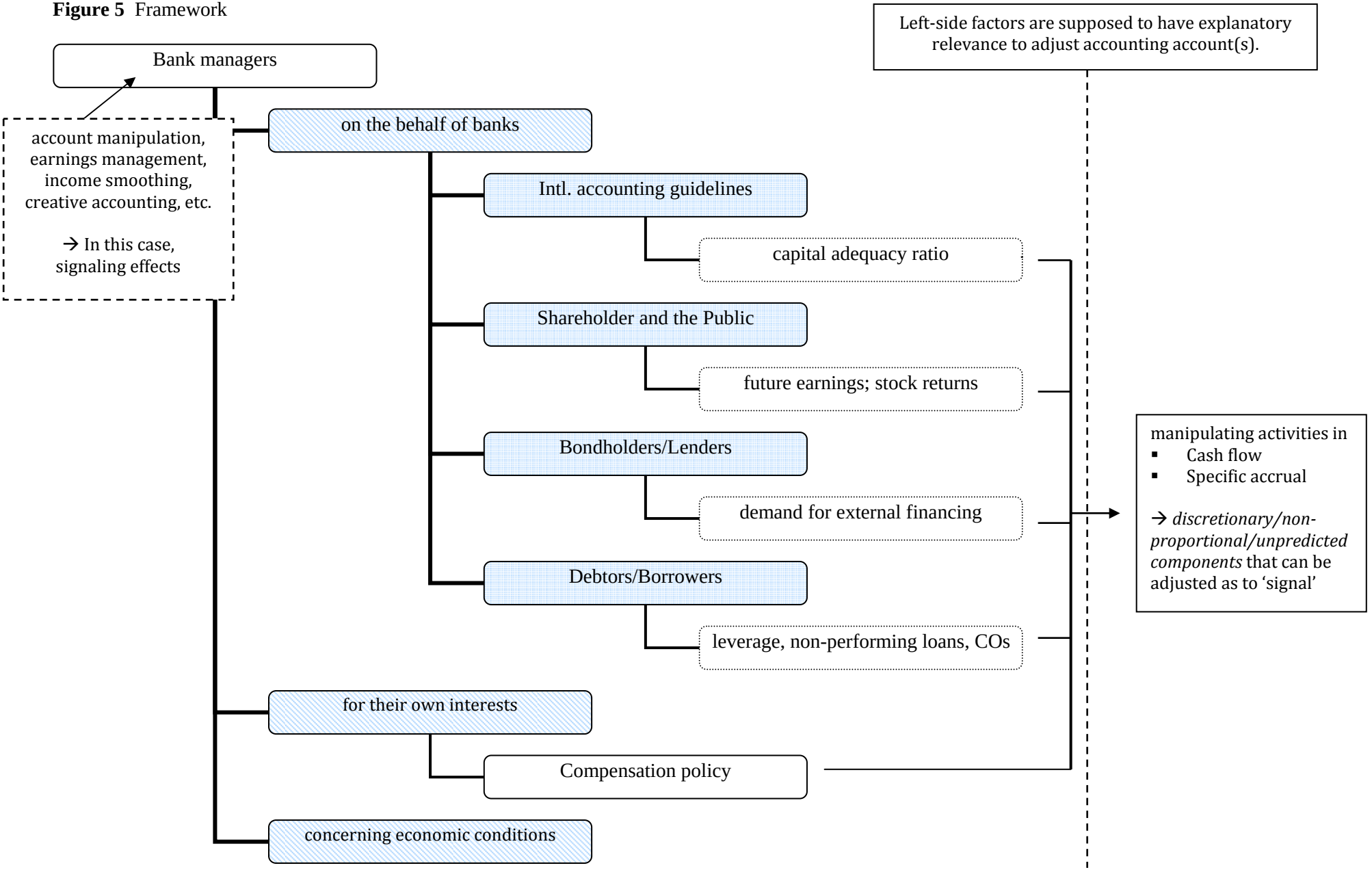


Table 1 Sample Features

	BHCs			CBs		
	mean	median	SD	mean	median	SD
Asset quality						
LLR/L	1.56	1.41	0.86	2.04	1.93	0.39
LLR/IL	105.99	73.12	99.56	95.67	82.77	46.29
IL/E	162.88	16.24	1226.26	23.57	19.57	13.57
IL/L	2.27	1.78	1.96	2.49	2.26	0.92
CO/L	0.88	0.39	1.14	0.94	0.73	0.56
Capital						
Tier1	11.77	11.86	2.77	11.46	10.95	2.55
E/L	9.91	8.76	7.57	10.89	10.66	3.1
capital fund/loan	13.21	11.5	8.02	13.41	13.78	1.47
capital fund/ deposit & ST fundings	20.96	13.08	33.96	21.32	14.99	12.62
Operations						
RoA	-0.07	0.26	1.63	-0.75	0.1	1.51
RoE	-6.68	3.35	45.9	-11.3	1.11	21.74
Dividend payout ratio	49.94	41.93	219.02	22.51	0.15	41.58
Cost to income ratio	78.38	71.69	29.88	77.61	72.92	15.67

Table 2 Descriptive Statistics

Panel A - raw data (in mil. US$)

		LLP	ΔL	LLR	CO	IL	ΔIL	EBTP	ΔEBTPe	BF
BHCs	min.	-73	-83777	1.9	-35	0.1	-2396	-19381	-38506	18.6
	max	33674	140500	16117	19021	10071	24997	45060	14645	977987
	mean	843.546	4429.937	802.986	638.022	493.723	183.864	1940.0565	-177.1753	49843.604
	S.D.	2819.4861	17072.007	2275.2838	1981.5411	1581.1794	1745.0677	6553.9646	3159.153	142644.52
CBs	min.	-194.1	-9674.6	-8.1	0.01	0.002	-379.9	-5525.9	-6480.8	0.02
	max	2857.85	23467.36	1949.11	831.5	1162.7	1035.16	1634.2	5895.3	75600.6
	mean	70.5144	1433.4661	50.8522	91.1674	83.790044	34.1371	148.0416	5.5731	6514.5452
	S.D.	246.27818	3717.6896	165.89145	160.05219	194.04335	122.80737	501.98556	671.537	12990.634

Panel B - scaled data

		LLP/E	ΔL/E	LLR/E	CO/E	IL/E	ΔIL/E	CAP	EBTP/E	ΔEBTPe/E	BF/E
BHCs	mean	0.045	1.274	0.076	0.039	0.067	0.037	0.117	0.207	0.018	3.496
	median	0.024	0.896	0.078	0.015	0.040	0.005	0.103	0.203	-0.006	2.421
	SD	0.071	2.429	0.052	0.057	0.103	0.190	0.088	0.468	0.609	23.052
	1st Q.	0.010	0.304	0.044	0.005	0.017	-0.004	0.086	0.137	-0.049	1.069
	3rd Q.	0.055	1.674	0.103	0.060	0.069	0.029	0.138	0.257	0.022	4.473
CBs	mean	0.050	1.404	0.076	0.032	0.041	0.025	0.319	0.318	0.017	3.839
	median	0.023	0.897	0.076	0.008	0.022	0.004	0.103	0.233	0.022	1.937
	SD	0.094	2.587	0.064	0.064	0.069	0.073	0.762	0.704	0.208	4.494
	1st Q.	0.003	0.182	0.022	0.001	0.003	-0.001	0.093	0.106	-0.013	0.686
	3rd Q.	0.057	1.769	0.106	0.038	0.053	0.028	0.138	0.366	0.074	5.964

note : In panel A, the variables are in raw values; in panel B, all are deflated by total equity (E), except CAP.

LLP = loan loss provisions

ΔL = change in total loans from the previous period to the current period

LLR = the beginning balance of loan loss reserves

CO = net charge-offs (equal to total charge-offs minus write-backs)

IL = the beginning balance of impaired loans

ΔIL = change in impaired loans

CAP = Tier I capital ratio

EBTP = earnings before taxes and provisions in the current period;

ΔEBTPe = change in one-year-ahead earnings before taxes and loan loss provisions;

BF = total borrowed funds

Table 3 Correlations

Panel A - BHCs

			LLP/E	ΔL/E	LLR/E	CO/E	IL/E	ΔIL/E	CAP	EBTP/E	ΔEBTPe/E	BF/E
LLP/E	r	1	-.214**	.561**	.899**	.419**	.312**	-.211**	-0.048	-0.029	0.052	
	Sig.		0.001	0	0	0	0	0.001	0.463	0.68	0.426	
ΔL/E	r		1	-.250**	-.174**	.298**	.549**	-.257**	.733**	.200**	-.565**	
	Sig.			0	0.007	0	0	0	0	0.004	0	
LLR/E	r			1	.561**	.333**	0.102	-.400**	-.147*	0.038	.172**	
	Sig.				0	0	0.133	0	0.027	0.59	0.008	
CO/E	r				1	.335**	0.13	-.190**	-0.07	0.093	0.081	
	Sig.					0	0.056	0.004	0.285	0.185	0.202	
IL/E	r					1	.702**	-.244**	.415**	0.106	-.269**	
	Sig.						0	0	0	0.138	0	
ΔIL/E	r						1	-.201**	.562**	.644**	-.451**	
	Sig.							0.003	0	0	0	
CAP	r							1	-.173**	-0.114	-0.008	
	Sig.								0.007	0.099	0.897	
EBTP/E	r								1	-.742**	-.874**	
	Sig.									0	0	
ΔEBTPe/E	r									1	.775**	
	Sig.										0	
BF/E	r										1	
	Sig.											

Panel B - CBs

			LLP/E	ΔL/E	LLR/E	CO/E	IL/E	ΔIL/E	CAP	EBTP/E	ΔEBTPe/E	BF/E
LLP/E	r	1	-.188**	.524**	.955**	.170*	.549**	-0.144	-.149*	0.087	-0.033	
	Sig.		0.01	0	0	0.019	0	0.053	0.042	0.241	0.642	
ΔL/E	r		1	-.219**	-.234**	-.157*	-0.063	-.175*	0.12	0.068	.313**	
	Sig.			0.003	0.001	0.033	0.396	0.025	0.102	0.384	0	
LLR/E	r			1	.574**	.193**	0.131	-.316**	-0.039	0.072	-.158*	
	Sig.				0	0.009	0.074	0	0.597	0.356	0.031	
CO/E	r				1	.219**	.476**	-0.128	-.184*	0.027	-0.024	
	Sig.					0.002	0	0.086	0.012	0.714	0.73	
IL/E	r					1	.383**	-0.138	-0.025	-0.118	0.041	
	Sig.						0	0.072	0.731	0.126	0.57	
ΔIL/E	r						1	-0.111	-.164*	-0.087	-0.018	
	Sig.							0.16	0.025	0.269	0.808	
CAP	r							1	-0.039	0.093	-.171*	
	Sig.								0.618	0.241	0.021	
EBTP/E	r								1	0.116	0.083	
	Sig.									0.136	0.258	
ΔEBTPe/E	r									1	-0.053	
	Sig.										0.474	
BF/E	r										1	
	Sig.											

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 4 Pooled time-series and cross-sectional regression

Dependent Variable: LLP. All defined as the same as in Table 2, Panel B.

Panel **A** BHCs

a. Predictors: (constant), ΔL, LLR, CO, IL, ΔIL, CAP, EBTP, ΔEBTPe, BF

coefficients

adjusted R^2 = 0.865, S.E. of estimates = 0.0136, Durbin-Watson = 1.879.

		(constant)	ΔL/E	LLR/E	CO/E	IL/E	ΔIL/E	CAP	EBTP/E	ΔEBTPe/E	BF/E
		α	β_1	β_2	β_3	β_4	β_5	β_6	β_7	β_8	β_9
	predicted signs	..	+	-	+	+	+	-	?	+	+
	S.E.	0.004	0.001	0.031	0.042	0.021	0.023	0.014	0.012	0.003	0.000
	beta		-0.00084876	0.048108768	0.756739119	0.046524704	0.389885313	-0.08218885	-0.06020188	-0.17858633	-0.23090833
	t-Statistic	2.113	-0.026	1.298	21.451	1.337	10.260	-2.218	-1.040	-3.396	-4.399
	Prob.	0.036	0.979	0.196	0	0.183	0	0.028	0.3	0.001	0
95%	Lower Bound	0.001	-0.002	-0.021	0.819	-0.013	0.188	-0.060	-0.037	-0.015	-0.001
Confidence	Upper Bound	0.017	0.002	0.102	0.985	0.068	0.277	-0.004	0.011	-0.004	0.000
Collinearity	Tolerance		0.730	0.561	0.619	0.636	0.534	0.561	0.230	0.279	0.280
Statistics	VIF		1.369	1.784	1.615	1.572	1.874	1.781	4.350	3.588	3.576

Collinearity Diagnostics

Dimension	Eigenvalue	Condition Index	Variance Proportions (constant)	ΔL/E	LLR/E	CO/E	IL/E	ΔIL/E	CAP	EBTP/E	ΔEBTPe/E	BF/E
1	4.463	1	0.00	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00
2	2.510	1.333	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.05	0.01	0.02
3	1.088	2.026	0.00	0.17	0.00	0.05	0.03	0.01	0.02	0.00	0.01	0.00
4	0.590	2.749	0.00	0.15	0.01	0.05	0.00	0.01	0.12	0.12	0.01	0.00
5	0.452	3.142	0.00	0.00	0.01	0.00	0.06	0.74	0.00	0.04	0.01	0.06
6	0.332	3.669	0.00	0.00	0.00	0.49	0.13	0.06	0.01	0.10	0.04	0.06
7	0.267	4.091	0.00	0.03	0.09	0.09	0.03	0.08	0.08	0.50	0.11	0.02
8	0.185	4.913	0.02	0.48	0.18	0.04	0.18	0.03	0.00	0.15	0.05	0.16
9	0.080	7.454	0.00	0.01	0.19	0.26	0.57	0.00	0.00	0.02	0.75	0.57
10	0.033	11.651	0.98	0.14	0.52	0.00	0.00	0.03	0.76	0.02	0.01	0.12

ANOVA

	sum of squares	df	mean square	F	Sig.
Regression	0.176953283	9	0.019661476	105.8588996	1.84357E-57
Residual	0.025631134	138	0.000185733		
Total	0.202584418	147			

residuals statistics

	min.	max.	mean	SD
Predicted Value	-0.02381079	0.250966728	0.029905356	0.0346953
Residual	-0.03173586	0.060429029	-2.3302E-17	0.0132046
Std. Predicted Value	-1.54822528	6.371507168	2.70523E-16	1
Std. Residual	-2.3286593	4.434056759	-1.7208E-15	0.968904283

Panel **B** CBs

b. Predictors: (constant), ΔL, LLR, CO, IL, ΔIL, CAP, EBTP, ΔEBTPe, BF.

coefficients

adjusted R^2 = 0.794, S.E. of estimates = 0.02201, Durbin-Watson = 1.497.

		(constant)	ΔL/E	LLR/E	CO/E	IL/E	ΔIL/E	CAP	EBTP/E	ΔEBTPe/E	BF/E
		α	β_1	β_2	β_3	β_4	β_5	β_6	β_7	β_8	β_9
	predicted signs	..	+	-	+	+	+	-	?	+	+
	S.E.	0.005	0.001	0.043	0.069	0.051	0.039	0.003	0.002	0.021	0.001
	beta	0.00132	0.0003	0.06404	1.09501	-0.017955	0.159174	-0.000494	0.00205	0.10591	-0.000162
	t-Statistic	0.280	0.351	1.497	15.908	-0.350	4.048	-0.170	0.845	4.953	-0.281
	Prob.	0.7798	0.726	0.1367	0.00E+00	0.7269	1.00E-04	0.865	0.3994	0	0.7788
95% Confidence	Lower Bound	-0.0080	-0.0014	-0.0206	0.9589	-0.1194	0.0814	-0.0062	-0.0027	0.0636	-0.0013
	Upper Bound	0.0106	0.0020	0.1486	1.2312	0.0835	0.2370	0.0052	0.0068	0.1482	0.0010
Collinearity Statistics	Tolerance		0.6499	0.4733	0.5439	0.8373	0.8392	0.7382	0.9296	0.7735	0.7733
	VIF		1.5386	2.1127	1.8387	1.1944	1.1916	1.3546	1.0757	1.2928	1.2932

Collinearity Diagnostics

Dimension	Eigenvalue	Condition Index	Variance Proportions (constant)	ΔL/E	LLR/E	CO/E	IL/E	ΔIL/E	CAP	EBTP/E	ΔEBTPe/E	BF/E
1	3.933	1	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.02
2	1.412	1.669	0.00	0.04	0.00	0.01	0.06	0.10	0.00	0.18	0.04	0.01
3	1.158	1.843	0.00	0.07	0.00	0.01	0.00	0.11	0.22	0.01	0.09	0.03
4	1.039	1.946	0.00	0.02	0.02	0.09	0.00	0.14	0.19	0.02	0.01	0.01
5	0.680	2.405	0.00	0.01	0.00	0.01	0.02	0.12	0.12	0.00	0.68	0.07
6	0.580	2.603	0.00	0.02	0.00	0.05	0.31	0.00	0.01	0.39	0.11	0.1
7	0.511	2.774	0.00	0.00	0.01	0.08	0.26	0.46	0.06	0.20	0.04	0.09
8	0.329	3.456	0.01	0.67	0.01	0.00	0.00	0.06	0.00	0.17	0.01	0.57
9	0.270	3.818	0.12	0.08	0.18	0.47	0.23	0.00	0.07	0.02	0.02	0
10	0.087	6.708	0.85	0.06	0.76	0.27	0.11	0.00	0.33	0.00	0.00	0.11

ANOVA

	sum of squares	df	mean	F	Sig.
Regression	0.271430506	9	0.030158945	62.24673889	1.55145E-43
Residual	0.064923861	134	0.000484506		
Total	0.336354367	143			

residuals statistics

	min.	max.	mean	SD
Predicted Value	-0.02105192	0.291078687	0.036000025	0.043567367
Residual	-0.04472893	0.103018112	1.92024E-17	0.021307581
Std. Predicted Value	-1.30951107	5.854810238	-2.5443E-17	1
Std. Residual	-2.03207064	4.680193424	9.57182E-16	0.968020112

Panel **C** BHCs (excl. crisis years)

c. Predictors: (constant), ΔL, LLR, CO, IL, ΔIL, CAP, EBTP, ΔEBTPe, BF

coefficients

adjusted R^2 = 0.841, S.E. of estimates = 0.01184, Durbin-Watson = 1.674.

		(constant)	ΔL/E	LLR/E	CO/E	IL/E	ΔIL/E	CAP	EBTP/E	ΔEBTPe/E	BF/E
		α	β_1	β_2	β_3	β_4	β_5	β_6	β_7	β_8	β_9
	predicted signs	..	+	-	+	+	+	-	?	+	+
	S.E.	0.004	0.001	0.029	0.044	0.021	0.036	0.012	0.012	0.008	0.000
	beta		0.059	0.032	0.892	0.011	0.092	-0.097	0.014	-0.047	-0.144
	t-Statistic	2.114	1.605	0.758	20.626	0.268	2.549	-2.373	0.333	-1.052	-2.858
	Prob.	0.036	0.111	0.450	0.000	0.789	0.012	0.019	0.739	0.295	0.005
95%	Lower Bound	0.001	0.000	-0.035	0.814	-0.035	0.021	-0.054	-0.020	-0.023	-0.001
Confidence	Upper Bound	0.016	0.004	0.079	0.987	0.046	0.164	-0.005	0.028	0.007	0.000
Collinearity	Tolerance		0.747	0.555	0.544	0.590	0.772	0.607	0.560	0.519	0.402
Statistics	VIF		1.338	1.801	1.840	1.695	1.295	1.648	1.787	1.927	2.487

Collinearity Diagnostics

Dimension	Eigenvalue	Condition Index	Variance Proportions (constant)	ΔL/E	LLR/E	CO/E	IL/E	ΔIL/E	CAP	EBTP/E	ΔEBTPe/E	BF/E
1	5.127	1	0.00	0.01	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00
2	1.274	2.006	0.00	0.00	0.00	0.00	0.00	0.05	0.01	0.00	0.25	0.05
3	1.221	2.049	0.00	0.02	0.00	0.01	0.03	0.24	0.01	0.00	0.00	0.07
4	0.853	2.452	0.00	0.06	0.00	0.09	0.02	0.36	0.02	0.00	0.02	0.00
5	0.558	3.030	0.00	0.11	0.03	0.02	0.03	0.03	0.23	0.01	0.00	0.02
6	0.442	3.405	0.00	0.20	0.00	0.12	0.06	0.12	0.02	0.03	0.24	0.06
7	0.219	4.834	0.01	0.14	0.13	0.07	0.47	0.05	0.00	0.00	0.11	0.33
8	0.176	5.401	0.00	0.26	0.13	0.64	0.38	0.00	0.05	0.03	0.03	0.11
9	0.086	7.704	0.00	0.04	0.51	0.04	0.00	0.09	0.12	0.78	0.25	0.12
10	0.043	10.981	0.98	0.15	0.20	0.00	0.00	0.07	0.54	0.15	0.09	0.23

ANOVA

	sum of squares	df	mean	F	Sig.
Regression	0.117367119	9	0.013040791	92.97177147	0
Residual	0.020759388	148	0.000140266		
Total	0.138126507	157			

residuals statistics

	min.	max.	mean	SD
Predicted Value	-0.02105639	0.110828161	0.0291286	0.027341567
Residual	-0.02786655	0.05962912	-1.3856E-17	0.01149893
Std. Predicted Value	-1.83548319	2.988108397	5.96394E-17	1
Std. Residual	-2.35291815	5.034797192	-1.1819E-15	0.970914599

Panel **D** CBs (excl. crisis years)

d. Predictors: (constant), ΔL, LLR, CO, IL, ΔIL, CAP, EBTP,ΔEBTPe, BF

coefficients

adjusted R^2 = 0.759, S.E. of estimates = 0.0238, Durbin-Watson = 1.464

		(constant)	ΔL/E	LLR/E	CO/E	IL/E	ΔIL/E	CAP	EBTP/E	ΔEBTPe/E	BF/E
		α	β_1	β_2	β_3	β_4	β_5	β_6	β_7	β_8	β_9
	predicted signs	..	+	-	+	+	+	-	?	+	+
	S.E.	0.005	0.001	0.047	0.075	0.051	0.063	0.003	0.003	0.012	0.001
	beta		0.082	0.085	0.823	-0.091	0.090	-0.023	0.058	0.038	-0.039
	t-Statistic	0.687	1.779	1.417	14.731	-1.951	1.983	-0.469	1.364	0.884	-0.878
	Prob.	0.493	0.077	0.159	0	0.053	0.049	0.640	0.175	0.379	0.381
95% Confidence	Lower Bound	-0.007	0.000	-0.026	0.958	-0.200	0.000	-0.008	-0.002	-0.013	-0.001
95% Confidence	Upper Bound	0.014	0.004	0.159	1.255	0.001	0.249	0.005	0.009	0.034	0.001
Collinearity Statistics	Tolerance		0.797	0.470	0.540	0.766	0.818	0.713	0.937	0.903	0.863
Collinearity Statistics	VIF		1.254	2.129	1.854	1.306	1.223	1.403	1.067	1.107	1.159

Collinearity Diagnostics

Dimension	Eigenvalue	Condition Index	Variance Proportions (constant)	ΔL/E	LLR/E	CO/E	IL/E	ΔIL/E	CAP	EBTP/E	ΔEBTPe/E	BF/E
1	3.772	1	0.01	0.01	0.01	0.01	0.02	0.00	0.00	0.01	0.00	0.02
2	1.248	1.739	0.00	0.09	0.00	0.01	0.06	0.33	0.01	0.02	0.00	0.00
3	1.130	1.827	0.00	0.03	0.00	0.01	0.00	0.04	0.33	0.13	0.00	0.01
4	1.093	1.858	0.00	0.03	0.00	0.06	0.00	0.07	0.01	0.01	0.48	0.00
5	0.837	2.123	0.00	0.05	0.02	0.07	0.01	0.04	0.04	0.13	0.17	0.16
6	0.708	2.308	0.00	0.04	0.00	0.00	0.02	0.13	0.14	0.50	0.19	0.01
7	0.466	2.846	0.00	0.16	0.01	0.15	0.39	0.28	0.06	0.13	0.02	0.00
8	0.415	3.015	0.00	0.43	0.00	0.01	0.12	0.01	0.00	0.02	0.09	0.62
9	0.250	3.881	0.10	0.06	0.24	0.43	0.24	0.03	0.05	0.05	0.02	0.02
10	0.081	6.828	0.88	0.09	0.72	0.25	0.14	0.06	0.35	0.00	0.03	0.15

ANOVA

	sum of squares	df	mean	F	Sig.
Regression	0.260789652	9	0.028976628	51.14593628	0
Residual	0.075917432	134	0.000566548		
Total	0.336707085	143			

residuals statistics

	min.	max.	mean	SD
Predicted Value	-0.04471558	0.304050118	0.031530023	0.042704846
Residual	-0.06117431	0.102876097	-7.0232E-18	0.023041075
Std. Predicted Value	-1.78540862	6.38147974	9.86865E-17	1
Std. Residual	-2.57010412	4.322113037	-2.5597E-16	0.968020112

Appendix - List of sample banks

Bank name	BvDEP* ID no.
Bank Holding Companies**	
Citigroup Inc	US48492
GE Capital-General Electric Capital Corporation	US19761
Taunus Corporation	US48577
US Bancorp	US49683
Capital One Financial Corporation	US49388
American Express Company	US48650
Hudson City Bancorp Inc	US17150
Colonial BancGroup, Inc	US38695
Webster Financial Corp	US48465
Valley National Bancorp	US34278
UCBH Holdings, Inc	US48069
East West Bancorp, Inc	US19314
Washington Federal Inc	US16767
Wintrust Financial Corp.	US48076
Umpqua Holdings Corporation	US19419
Capitol Federal Financial	US40216
Santander BanCorp	US46652
R&G Financial Corporation	US48541
Boston Private Financial Holdings Inc	US47943
Investors Bancorp, MHC	US48036
Oriental Financial Group Inc	US48540
Mercantil Commercebank Florida Bancorp	US68538
Glacier Bancorp, Inc	US17493
Western Alliance Bancorporation	US70146
Texas Capital Bancshares, Inc	US19416

Bank name	BvDEP* ID no.
Commercial Banks**	
CIT Group, Inc.	US49731
Harris National Association	US63605
AgriBank, FCB	US45337
Morgan Stanley Bank, NA	US64460
Fifth Third Bank	US35173
U.S. AgBank, FCB	US40249
Wells Fargo Bank South Central National Association	US68020
Bank of America California, National Association	US60369
United Commercial Bank	US48512
Banco Popular North America	US17417
Bank of America Oregon, National Association	US60371
Doral Bank	US61948
Citizens Business Bank	US61281
California National Bank	US17581
Bank of North Georgia	US60597
BMW Bank of North America	US60862
Texas Capital Bank, N.A.	US16970
National Bank of Arizona	US64504
US Bank National Association, ND	US47587
Irwin Union Bank and Trust Company	US16560
Nevada State Bank	US64557

* BvDEP stands for 'Bureau van Dijk Electronic Publishing', i.e. the BankScope database.

** The banks in each group are sorted by their total assets in descending order.

Appendix - Empirical Studies

authors	purpose	sample	results
Agusman et al.(2008)	to examine the effects of the loan-loss-reserves-to-gross-loans ratio on stock returns	42 Asian banks during 1999-2007	a negative and significant relation between the ratio and bank stock returns
Ahmed et al.(1999)	to exploit the 1990 change in capital adequacy regulations to construct more powerful tests of capital and earnings management and their effects on bank LLPs	113 bank holding company during 1985-1989	(1) LLP reflects meaningful changes in the expected quality of banks' loan portfolios; (2) LLP are used for capital management rather than for earnings management; (3) the desire to signal private information to outsiders is not an important determinant of LLP.
Anandarajan et al (2005)	to examine the extent of the efficiency associated with LLP strategy	depository institutions in Spain during 1986-1995	(1) LLP inefficiency is higher in the commercial banking sector composed of mostly stock institutions relative to the mutually owned savings banks; (2) the commercial banks listed in the stock market had greater deviations from the stochastic frontier implying greater LLP inefficiency.
Anandarajan et al (2007)	to examine whether and to what extent banks use LLPs for capital, earnings management and signaling	50 Australian commercial banks during 1991-2001	Australian banks (1) use LLPs for capital management but not change much after Basel; (2) use LLPs for earnings managment and listed commercial banks do so in particular to a greater extent; (3) using LLPs was accentuated after Basel; (4) do not appear to use LLPs for signalling future intentions of higher earnings to investors.
Beaver & Engel (1996)	to examine the capital market pricing of components of a major accrual	over 90 largest U.S. banks during 1977-1991	LLA comprised of two components: the nondiscretionary component is negatively priced but the discretionary component is positively priced, by the maket.
Burgstahler & Dichev (1997)	to provides evidence that firms manage reported earnings to avoid earnings decreases and losses	all available commercial firms on the annual Compustate databases for the years 1976-1994	8-12% of firms with small pre-managed earnings decreases manipulate earnings to achieve earnings increases, and 30-44% of firms with small pre-managed losses manage earnings to create positive earnings.
Collins et al. (1995)	to examine on the impact of individual banks' changing levels of capital, earnings, and taxes on decisions to engage in seven capital-raising options	160 banks from the 1973-1991 Bank Compustate annual files	(1) Earnings and tax influence realizations of security gains and losses, and capital plays a minor role. (2) Capital managers decrease LLPs in periods of low capital. (3) LLPs are proved to manage earnings. (4) Capital management is highly relevant to COs and external financing decisions.
Cornett et al.(2009)	to examine whether corporate governance mechanisms affect earnings and earnings management at the largest publicly traded bank holding companies in the U.S.	46 bank holding companies during 1994-2002	(1) Corporate governance plays at least some role in earnings and earnings management at large U.S. banks. (2) Performance, board independence, and capital are negatively related to earnings management. (3) Although evidence of earnings smoothing, some corporate governance mechanisms (e.g., board independence) constrain earnings management whereas others (e.g., CEO pay-forperformance) induce it.

Dechow et al.(1995)	to evaluate several accrual-based models for detecting earnings management	n.a.	(1) All the models appear well specified when applied to a random sample of firm-years. (2) The importance of controlling fiancial performance when invessting earnings management stimulus is highlighten. (3) The modifed Jones model exhibits the most testing power.
Dechow et al.(1996)	to investigate firms subject to accounting enforcement actions by the Securities and Exchange Commission (SEC) for alleged violations of GAAP - earnings manipulations	n.a.	(1) One motivation for earnings manipulation is the desire to attract external financing at low cost. (2) Firms manipulating earnings experience significant increases in their costs of capital when the manipulations are made public.
Eng & Nabar (20(	to examine the behavior of loan loss accounting disclosures of banks	35 bank holding companies in SouthAsia during 1993-2000	Banks' unexpected loan loss provisions are positively associated with future cash flows and stock returns. Asian bank managers increase loan loss provisions when future cash flow prospects improve and Asian bank investors correctly interpret this signal.
Hasan & Wall (2004)	to analyse the determinants of banks' loan loss allowances by comparing samples across the U.S. border	2,620 U.S.bank observations, 871 non-U.S. observations during 1993-2000	(1) The loan loss allowance is sensitive to pre-provision income in almost all samples. (2) Some variables thought to reflect fundamental factors in US analysis, such as net chargeoffs, are not significant factors for non-US banks.
Kanagaretnam et al.(2004)	to investigate bank managers' use of discretion in estimating LLPs to reduce earnings variablity.	n.a.	(1) The propensity to decrease earnings by increasing discretionary LLP is high for banks with relatively high pre-managed earnings. (2) The degree of income smoothing through LLP is positively related to the demand of external financing. (3) The degree of income smoothing through discretionary LLP is negatively related to realized gains and losses on securities held for sale.
Kanagaretnam et al.(2005)	to investigate bank managers' use of discretion over estimated LLP to signal information about future earnings	78 banks during 1981-1996	The propensity to signal is: negatively related to bank size; postively related to earnings variablity, the size of the investment opportunity set, and the degree of income smoothing.
Kim & Kross (1998)	to investigate whether banks with low capital ratios use accounting accruals for capital ratio management.	all the bank holding companies with SIC codes 6021 and 6022 on the 1991 Compustat Annual Industrial File	Banks with low capital ratios have larger write-offs (as a fraction of total assets) during 1990–1992 than during 1985–1988.
Lobo & Yang (2001)	to investigate bank managers ' discretionary behaviours related to three major motivations: capital management, income smoothing and signaling effect	1,658 bank-year observations | 1981- 1996	(1) LLP as a major accrual is used by bank managers to reduce the variability of the earning series; (2) Signalling through LLP is more strongly needed when managers believe their bank values are underestimated.
Ma (1988)	to determine whether US commercial banks utilize the LLP as a device to smooth reported earnings	45 largest U.S. banks ranked by *The American Banker* | 1980 -1984 (quarterly data)	strong evidence that U.S. commercial banks have used LLP provisions and charge-offs to smooth; thus, LLP does not fully reflect the actual quality of banks' loan portfolios.

McNichols &Wilson (1988)	to examine whether managers manipulate earnings by a specific accounting number, the provision for bad debts	all firms on Compustate 1986 Industrial Tape, esp. those whose provisions for bad debts are large relative to earnings.	strong association between the provision for bad debts and at the same time as well as future write-offs; evidence that firms manage their earnings by choosing income-decreasing accruals when income is extreme.
McNichols (2000	to discusses trade-offs associated with three research designs commonly used in the earnings management literature	n.a.	Future progress in the earnings management literature is more likely to come from application of specific accrual and distribution-based tests than from aggregate accruals tests.
Pérez et al.(2008)	to test income smoothing and capital management practices through LLP by Spanish banks	142 banks in the period of 1986-2002	(1) Evidence of income smoothing through general and specific loan loss provisions, but no capital management, among Spanish banks. (2) Basel II framework facilitates the compatibility of banking practice over different countries but earnings volatility by management remains. (3) Transparent smoothing devices, such as the countercyclical statistical provision, induce banks to reduce other, opaque, smoothing practices.
Petroni et al.(2000)	to examinate the effects of LLPs in capital and earnings management	Spanish banks in 2002	strong evidence for income smoothing through LLPs but no evidence for capital management through LLPs
Rivard et al.(2003)	to exam whether banks still use LLPs for income smoothing after Basel Accord	96 banks during 1992 - 1997	(1) Continued existence of income smoothing is confirmed; (2) banks become more aggressive in using loan-loss reserves as a tool for income smoothing.
Wahlen (1994)	to analyse 3 determinating factors for information about future bank cash flows and investors' reaction - impound the information in stock prices	annual data: 106 commercial banks | 1977 -1988; quarterly data: 86 banks | 1984:4 - 1989:3	(1) the relation bet.unexpected provisions and both returns and future cash flows are positive only when unexpected changes in impaired loans and unexpected charge-offs are included in the analysis. (2) the information effect of accounting documents to investors concerning management discretions is emphasied.
Wetmore & Brick (1994)	to implementing a model for evaluating the adequacy of LLPs (the tie between relevant criteria to the actual provision)	82 out of Moody's top 100 banks in the period 1986 -1990	(1) bank managers (except of money-center banks) tend to consider past experience in loan losses, foreign loan risk, deterioration of quality of loan portfolios, and economic conditions when determining loan-loss provisions. (2) Bank loan-loss provisions are larger in 1987 due to LDC loans. (3) no evidence of income smoothing

Note: the table only presents the prior papers which directly study on account managemment; other papers which conduct rather general studies are not included here, though they do provide relevant information in the main content. After all, all the papers can be tracked in the reference.